

Fig. 1

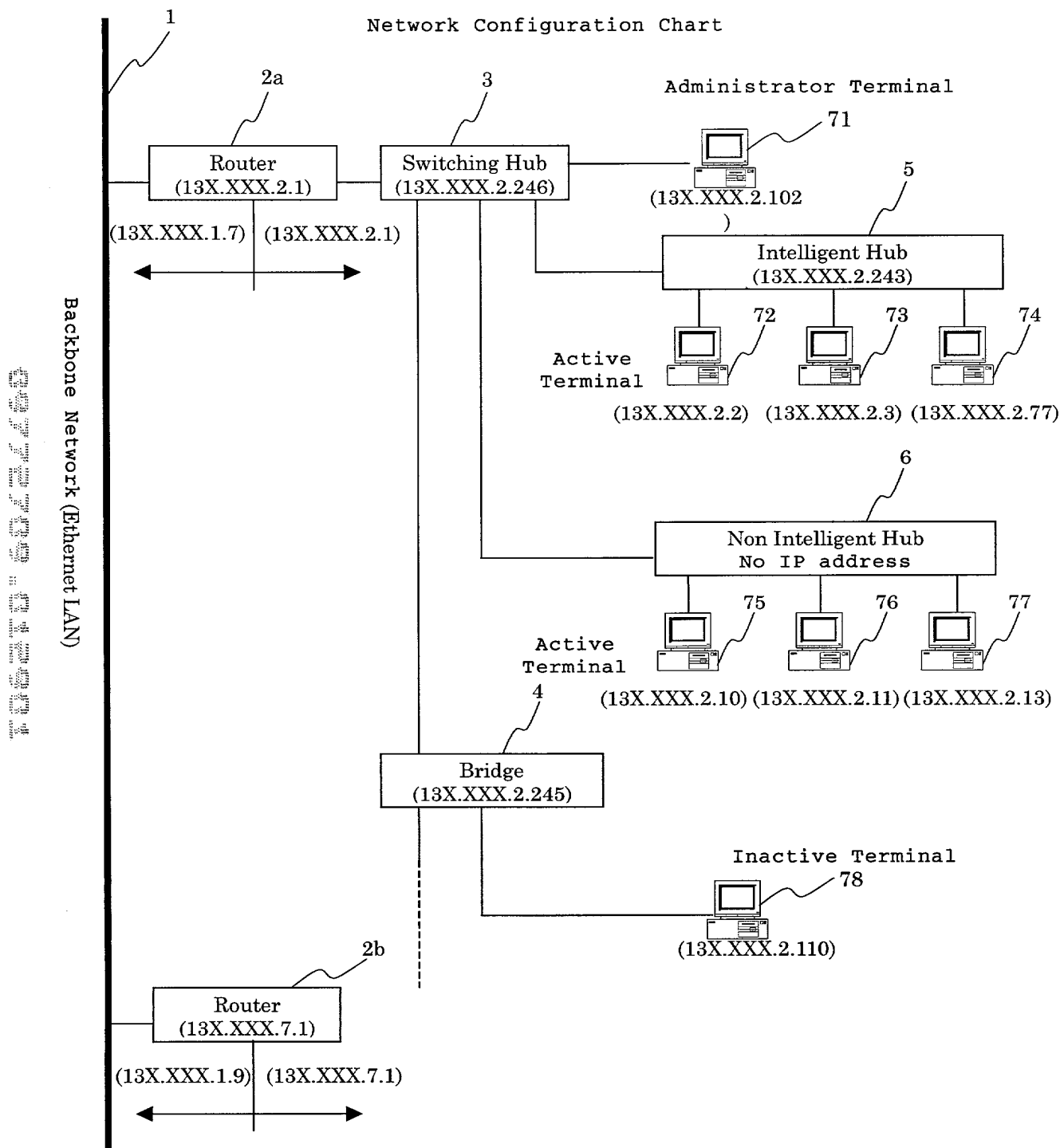
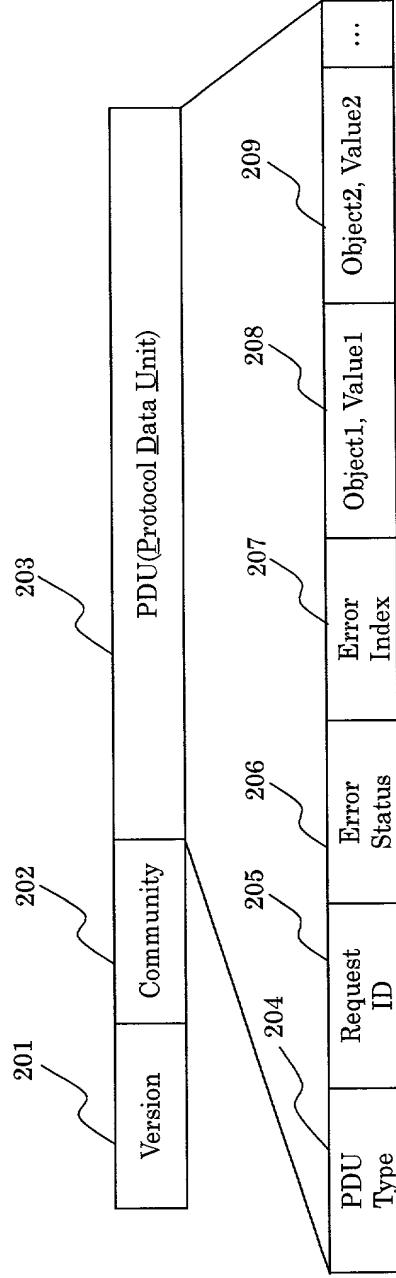


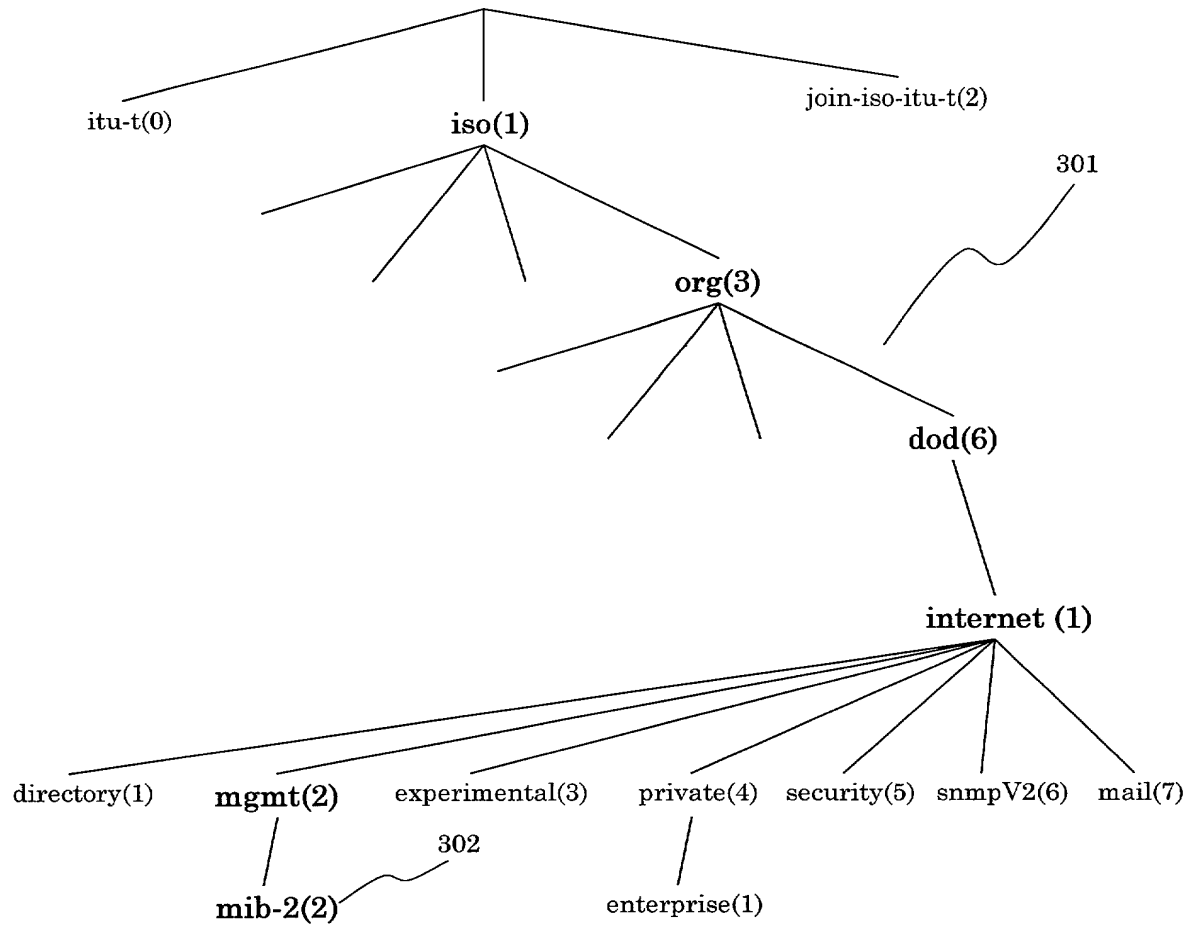
Fig. 2

SNMP Message Format



# Fig. 3

Internet OID (Object Identifier) Tree



# Fig. 4

MIB2 Object Configuration

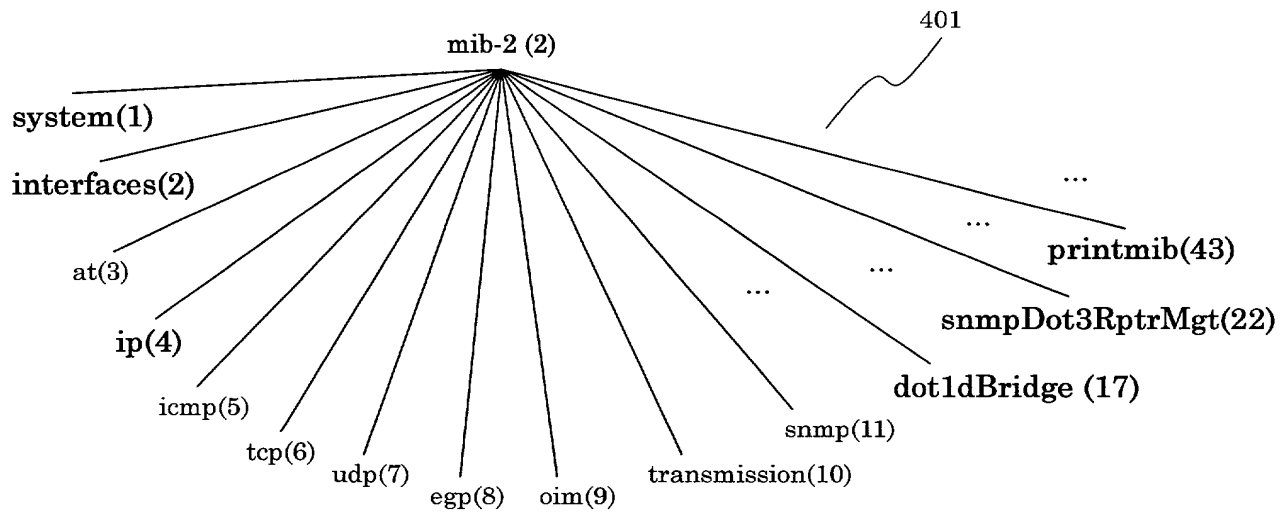
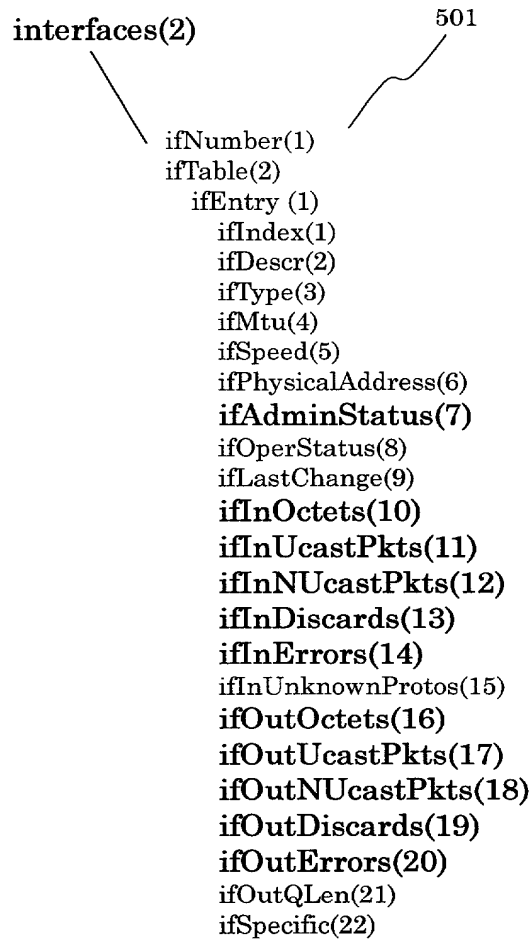


Fig. 5

interfaces Group Object Configuration



# Fig. 6

## Program Configuration Chart

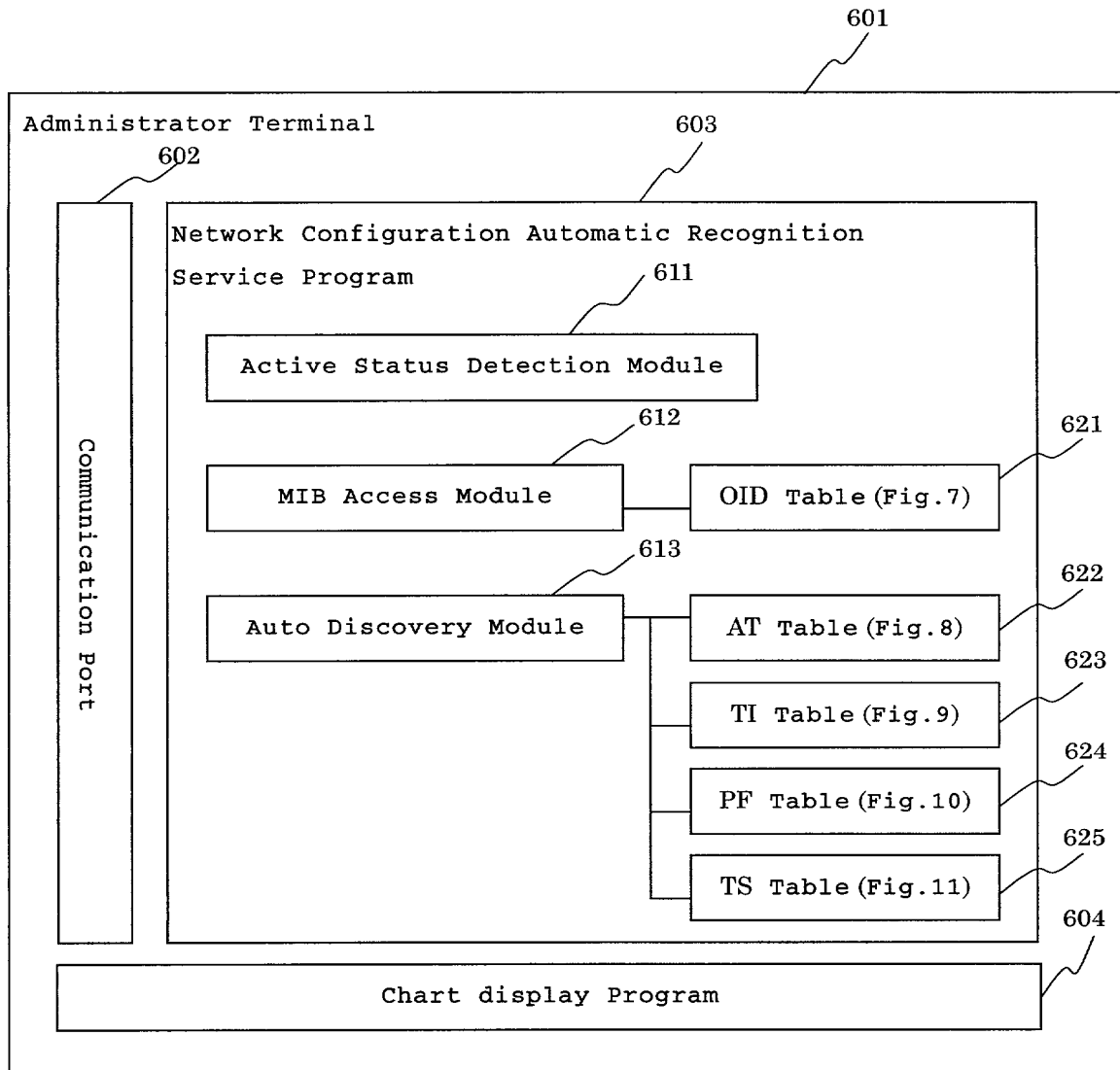


Fig. 7

OID(Object Identifier) Table Configuration Chart

701	702	703	704	621
Object Name	Object Identifier	type	Object Path	
sysDescr	43.6.1.2.1.1.1.0	String	system.sysDescr	
sysObjectID	43.6.1.2.1.1.2.0	Binary	system.sysObjectID	
...	...	...	...	

Fig. 8

AT(Address Translation) Table Configuration Chart

801	802	622
IP Address	Mac Address	
13X.XXX.2.1	00:e0:f7:26:a4:e3	
13X.XXX.2.2	08:00:20:11:ee:73	
...	...	

Fig. 9

TI(Terminal Information) Table Configuration Chart

623

901	902	903	904	905	906	907	908	909	910
IP Address	Mac Address	Host Name	type	alive	mib2	forwarding	bridge	repeater	print
13X.XXX.2	00:e0:f7:26:a4:e3	ori-irouter.ori.xxx.co.jp	R	On	On	On	On	Off	Off
13X.XXX.2	08:00:20:a1:33:ab	ori.ori.xxx.co.jp	T	On	On	Off	Off	Off	Off
13X.XXX.2	—	—	—	On	Off	Off	Off	Off	Off
...	...	...	...	...	...	...	...	...	...

(U:Unkown:0,R:Router:1,SH:SwitchingHub:2,IH:IntelligentHub:3,  
B:Bridge:4,R:Repeater:5,T:Terminal:6,P:Printer:7)(On:1、Off:0)



Fig. 10

PF(Port Forwarding) Table Configuration Chart

1001	1002	1003	1004	1005
Source IP Address	Source Mac Address	Source Port	Destination IP Address	Destination Mac Address
...	...	2	13X.XXX.2.2	08:00:20:a1:33:ab
13X.XXX.2.1	00:e0:f7:26:a4:e3	2	13X.XXX.2.102	00:e0:18:00:27:d7
...	...	...	...	...
...	...	2	13X.XXX.2.246	08:00:4e:4f:ad:27
...	...	...	...	...
13X.XXX.2.246	08:00:4e:4f:ad:27	2	13X.XXX.2.1	00:e0:f7:26:a4:e3
...	...	...	...	...

Fig. 11

TS(Tree Structure) Table Configuration Chart

1101	1102	1103	1104	1105	1106
Terminal IP Address	Terminal Mac Address	Terminal Port	Parent IP Address	Parent Mac Address	Parent Port
13X.XXX.2.1	00:e0:f7:26:a4:e3	—	—	—	—
13X.XXX.2.246	08:00:4e:4f:ad:27	2	13X.XXX.2.1	00:e0:f7:26:a4:e3	2
13X.XXX.2.102	00:e0:18:00:27:d7	—	13X.XXX.2.246	08:00:4e:4f:ad:27	3
...	...	...	...	...	...
13X.XXX.2.243	00:00:f4:71:01:37	1	13X.XXX.2.246	08:00:4e:4f:ad:27	1
...	...	...	...	...	...
13X.XXX.2.2	08:00:20:a1:33:ab	—	13X.XXX.2.243	00:00:f4:71:01:37	2
...	...	...	...	...	...

Fig. 12

## Mechanism of Sending/Receiving SNMP Message

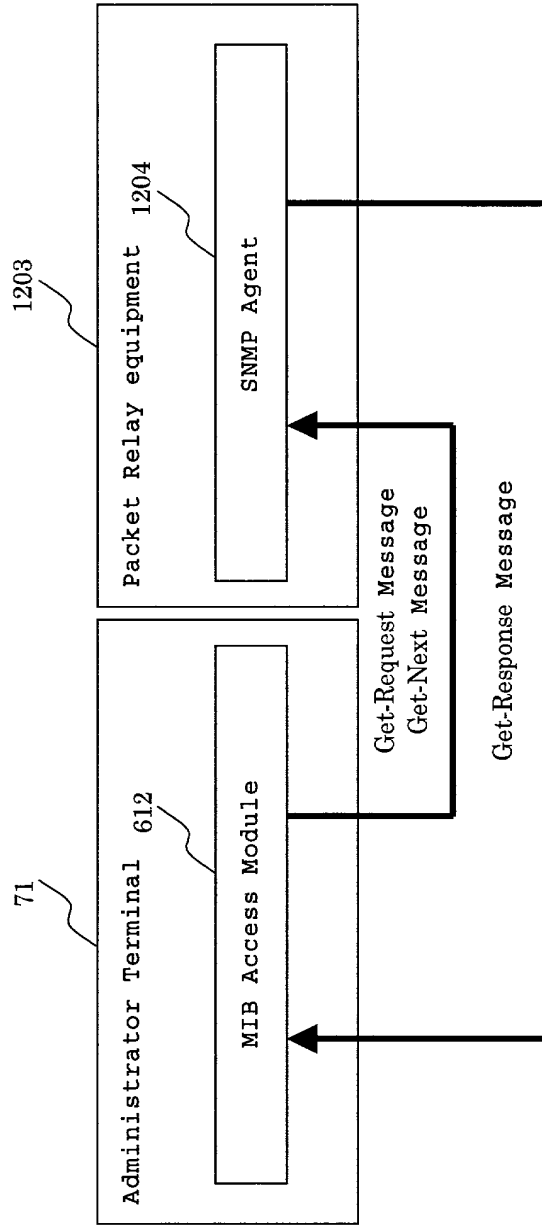


Fig. 13

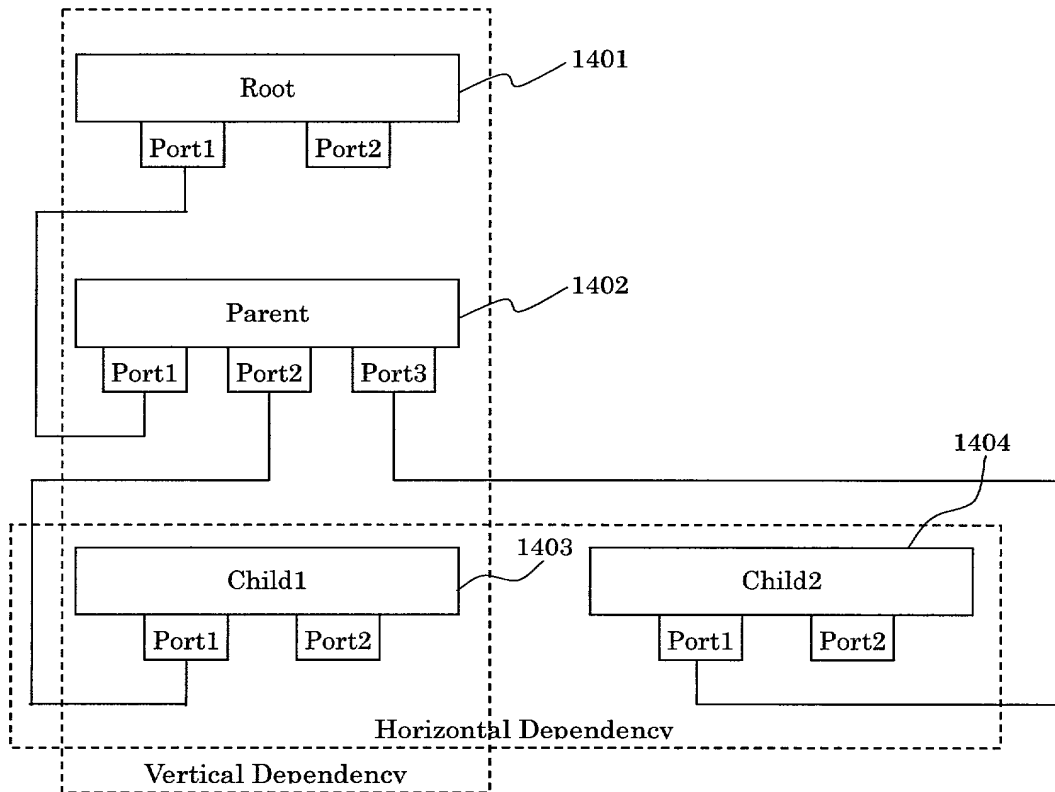
Method of Detecting Device Type

Device MIB	Router	Bridge	Switching Hub	Intelligen Hub	Non Intelligent Hub (Repeater)	Printer	Terminal
ip Group ipForwarding Object	○ (Value =1)	○ (Value =0)	○ (Value =1 or Value=0)	○ (Value =0)	—	○ (Value =0)	○ (Value =0)
dot1dBridge Group Any Object	○	○	○	×	—	×	×
snmpDot3RptrMgt Group Any Object	×	×	○	○	—	×	×
printmib Group Any Object	×	×	×	×	—	○	×

Note)(○ : Implemented, × : Unimplemented, — : MIB Unsupported)

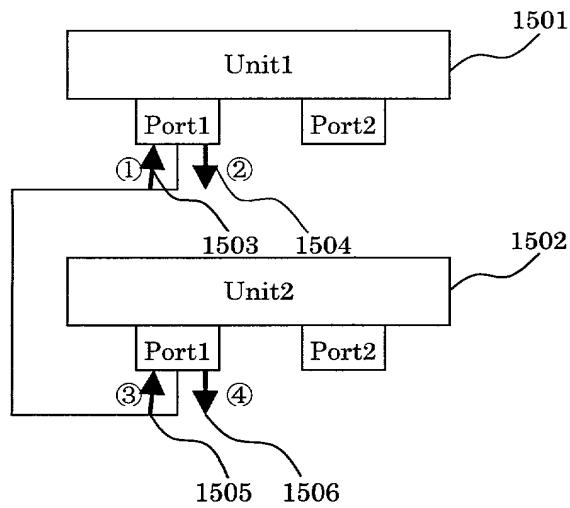
# Fig. 14

Definition Diagram of Packet Relay Equipment Relation



# Fig. 15

Detection of Connection between Pieces of Packet Relay Equipment by Using interfaces MIB



[Information to acquire]

- ① ifInOctets(Port1 of Unit1)
- ② ifOutOctets(Port1 of Unit1)
- ③ ifInOctets(Port1 of Unit2)
- ④ ifOutOctets(Port1 of Unit2)

[Detection conditions]

- No significant difference between ① and ④
  - No significant difference between ② and ③
- Port1 of Unit 1 and Port 2 of Unit 2 are in connection

# Fig. 16

## Network Device Classification

Network Device	Description
R	Packet relay equipment for segment division (Router)
CF	Packet relay equipment that has no imperfection in MIB object information stored and can create PF table listing all the connection ports of the packet relay equipment and terminals
IF	Packet relay equipment that has some imperfections in MIB object information stored and sometimes fails to detect connection port numbers to other pieces of packet relay equipment excepting R
SF	Packet relay equipment that has some imperfections in MIB object information stored, cannot detect any of the ports connected to all the other pieces of packet relay equipment including R, and can detect the port(s) connected to one or more terminals
NF	Packet relay equipment holding no MIB (Non Intelligent Hub, Repeater)
Term	Device other than packet relay equipment (Printer, Terminal)

# Fig. 17

Mechanism of Connection Detection for R-CF-\* Model (\* represents any one of CF2,IF2,SF2)

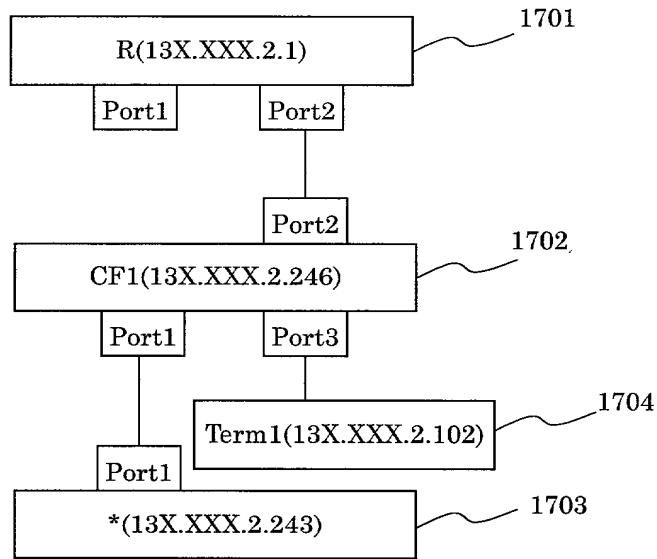




Fig. 18

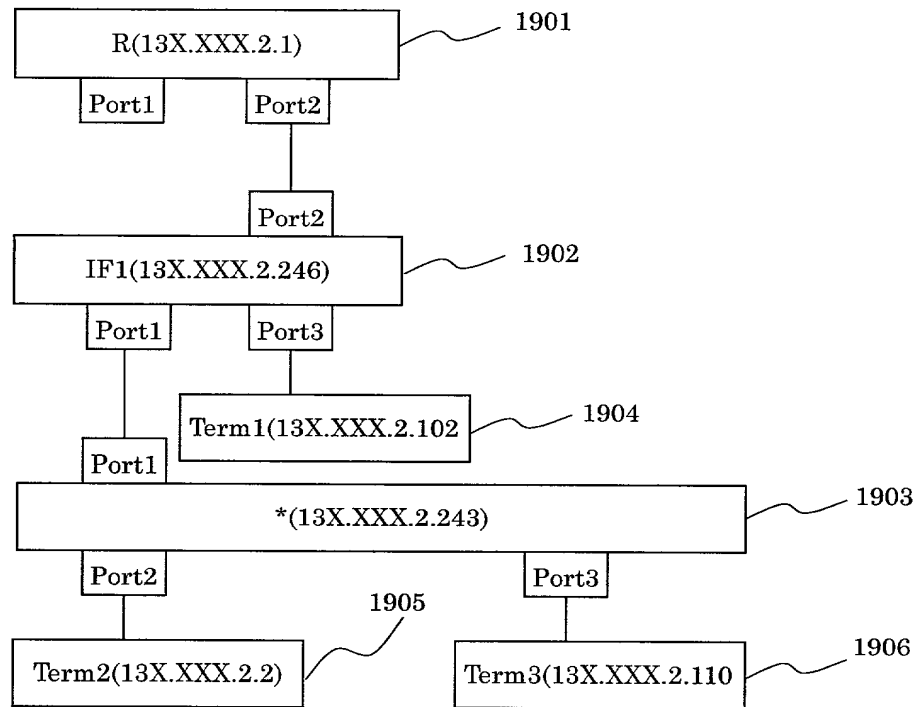
PF Table Entry for Use in Connection Detection for R-CF-\* Model  
Model

Source IP Address	Source Mac Address	Source Port	Destination IP Address	Destination Mac Address
...	...	...	...	...
13X.XXX.2.246	08:00:4e:4f:ad:27	1	13X.XXX.2.243	00:00:f4:71:01:37
13X.XXX.2.246	08:00:4e:4f:ad:27	2	13X.XXX.2.1	00:e0:f7:26:a4:e3
13X.XXX.2.246	08:00:4e:4f:ad:27	3	13X.XXX.2.102	00:e0:18:00:27:d7
...	...	...	...	...
13X.XXX.2.243	00:00:f4:71:01:37	1	13X.XXX.2.102	00:e0:18:00:27:d7
13X.XXX.2.243	00:00:f4:71:01:37	1	13X.XXX.2.1	00:e0:f7:26:a4:e3
...	...	...	...	...

1801  
1802  
1803  
1804  
1805

# Fig. 19

Mechanism of Connection Detection for R-IF-\* Model (\* represents any one of CF2, IF2, SF2)



# Fig. 20

PF Table Entry for Use in Connection Detection for R-IF-\* Model

Source IP Address	Source Mac Address	Source Port	Destination IP Address	Destination Mac Address
...	...	...	...	...
13X.XXX.2.246	08:00:4e:4f:ad:27	1	13X.XXX.2.2	00:e0:f7:26:a4:e3
13X.XXX.2.246	08:00:4e:4f:ad:27	1	13X.XXX.2.110	00:e0:18:00:3a:9f
13X.XXX.2.246	08:00:4e:4f:ad:27	3	13X.XXX.2.102	00:e0:18:00:27:d7
13X.XXX.2.246	08:00:4e:4f:ad:27	2	13X.XXX.2.1	00:e0:f7:26:a4:e3
...	...	...	...	...
13X.XXX.2.243	00:00:f4:71:01:37	1	13X.XXX.2.102	00:e0:18:00:27:d7
13X.XXX.2.243	00:00:f4:71:01:37	2	13X.XXX.2.2	00:e0:f7:26:a4:e3
13X.XXX.2.243	00:00:f4:71:01:37	3	13X.XXX.2.110	00:e0:18:00:3a:9f
13X.XXX.2.243	00:00:f4:71:01:37	1	13X.XXX.2.1	00:e0:f7:26:a4:e3
13X.XXX.2.243	00:00:f4:71:01:37	1	13X.XXX.2.246	08:00:4e:4f:ad:27
...	...	...	...	...

624

Fig. 21

Mechanism of Connection Detection for R-SF-\* Model (\* represents any one of CF2,IF2,SF2)

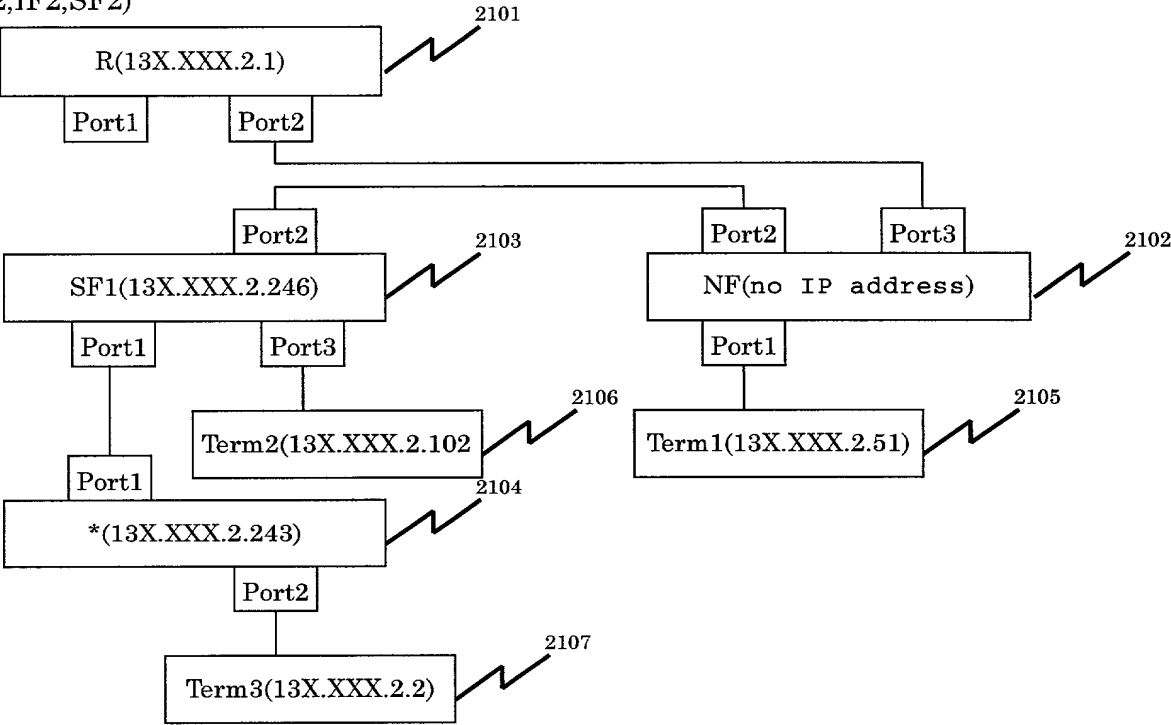


Fig. 22

PF Table Entry for Use in Connection Detection for R-SF-IF Model

Source IP Address	Source Mac Address	Source Port	Destination IP Address	Destination Mac Address
...	...	...	...	...
13X.XX.2.246	08:00:4e:4f:ad:27	1	13X.XXX.2.2	00:e0:f7:26:a4:e3
13X.XXX.2.246	08:00:4e:4f:ad:27	2	13X.XXX.2.51	00:00:92:96:b4:43
13X.XXX.2.246	08:00:4e:4f:ad:27	3	13X.XXX.2.102	00:e0:18:00:27:d7
...	...	...	...	...
13X.XXX.2.243	00:00:f4:71:01:37	1	13X.XXX.2.51	00:00:92:96:b4:43
13X.XXX.2.243	00:00:f4:71:01:37	1	13X.XXX.2.102	00:e0:18:00:27:d7
13X.XXX.2.243	00:00:f4:71:01:37	2	13X.XXX.2.2	00:e0:f7:26:a4:e3
13X.XXX.2.243	00:00:f4:71:01:37	1	13X.XXX.2.1	00:e0:f7:26:a4:e3
13X.XXX.2.243	00:00:f4:71:01:37	1	13X.XXX.2.246	08:00:4e:4f:ad:27
...	...	...	...	...

Fig. 23

Mechanism of Connection Detection for R-\* Model (\* represents any one of CF,IF,SF)

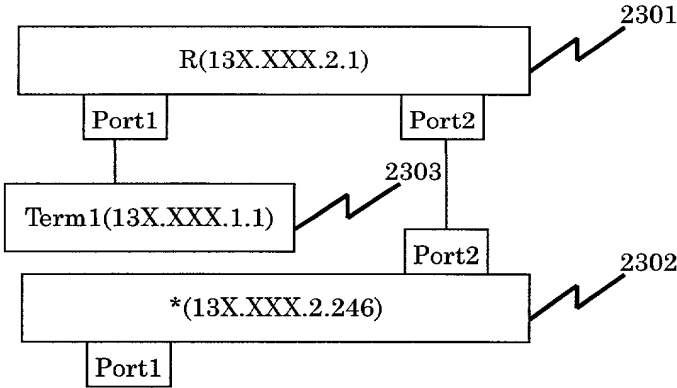


Fig. 24

PF Table Entry for Use in Connection Detection for R-\* Model

Source IP Address	Source Mac Address	Source Port	Destination IP Address	Destination Mac Address
...	...	...	...	...
13X.XXX.2.1	00:e0:f7:26:a4:e3	2	13X.XXX.1.246	08:00:4e:4f:ad:27
13X.XXX.2.246	08:00:4e:4f:ad:27	1	13X.XXX.1.1	08:00:20:74:d5:86
13X.XXX.2.246	08:00:4e:4f:ad:27	2	13X.XXX.2.1	00:e0:f7:26:a4:e3
...	...	...	...	...

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2401

2402

2403

# Fig. 25

Method of Detecting Connections among Pieces of Packet Relay Equipment

Connection Model	Parent-to-Child Connection Port	Child-to-Parent Connection Port	Vertical Dependency	Condition for Connection Detection
R-CF1-CF2	○	○	○	—
R-CF-IF	○	○	○	—
R-CF-SF	○	△	○	(1) one or more devices connected to ports other than connection port of CF to SF (2) device(s) of (1) stored in SF forwarding table
R-IF-CF	○	△	△	(1) one or more devices connected to ports other than connection port of CF to IF (2) device(s) of (1) stored in IF forwarding table
R-IF1-IF2	△	△	△	(1) one or more devices connected to ports other than connection port of IF1 to R (2) device(s) of (1) stored in R-containing port entries of IF2 forwarding table (3) one or more devices connected to ports other than connection port of IF2 to R (4) device(s) of (3) stored in port entries of IF1 forwarding table except R-containing port entries
R-IF-SF	△	△	△	(1) two or more devices connected to ports other than connection port of IF to R (2) device(s) of (1) stored in particular port entries of SF forwarding table (3) device(s) of (1) other than those of (2) stored in port entries of SF forwarding table except those of (2) (4) one or more devices connected to ports other than connection port of IF to R, except ports of (1) (5) device(s) of (4) stored in particular port entries of SF forwarding table

Note)

○ : connection detectable

△ : connection detectable if the condition for connection detection is satisfied

× : connection undetectable



# Fig. 26

Method of Detecting Connections among Pieces of Packet Relay Equipment

Connection Model	2601 Parent-to-Child Connection Port	2602 Child-to-Parent Connection Port	2603 Vertical Dependency	2604 2605 Condition for Connection Detection
R-SF-CF	△	○	×	(1) one or more devices connected to ports other than connection port of CF to SF (2) device(s) of (1) stored in particular port entries of SF forwarding table
R-SF-IF	△	△	×	(1) more than two device connected to the same port as connection port of IF to R (2) devices of (1) stored in particular port entries of SF forwarding table (3) devices of (1) other than those of (2) stored in port entries of SF forwarding table except those of (2) (4) one or more devices connected to ports other than the connection port of IF to R (5) device(s) of (4) connected to particular port entries of SF forwarding table
R-SF1-SF2	×	×	×	—
R-CF	△	○	○	R forwarding table includes port with internal network IP address
R-IF	△	○	○	R forwarding table includes port with internal network IP address
R-SF	△	△	○	(1) R forwarding table includes port with internal network IP address (2) SF forwarding table includes port with backbone network IP address

Note)

○ : connection detectable

△ : connection detectable if the condition for connection detection is satisfied

×

 : connection undetectable

Fig. 27

Mechanism of Connection Detection for \*-TERM Model (\* represents any one of CF, IF, SF)

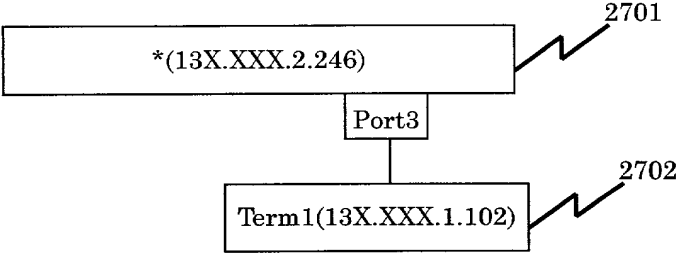


Fig. 28

PF Table Entry for Use in Connection Detection for \*.TERM Model

Source IP Address	Source Mac Address	Source Port	Destination IP Address	Destination Mac Address
...	...	...	...	...
13X.XXX.2.246	08:00:4e:4f:ad:27	1	13X.XXX.2.102	00:e0:18:00:27:d7
...	...	...	...	...

624

2801

Fig. 29

Method of Detecting Connection between Packet Relay Equipment and Terminal

Equipment Connection model	Detection of Terminal Connection	Condition for Connection Detection
CF-TERM	○	—
IF-TERM	○	—
SF-TERM	△	One terminal connected to a port

# Fig. 30

Detection of Vertical Dependency through Combination of Plurality of Models  
(Example of detecting the vertical dependency in R-SF-CF model by combining R-CF-CF model and R-CF-SF model)

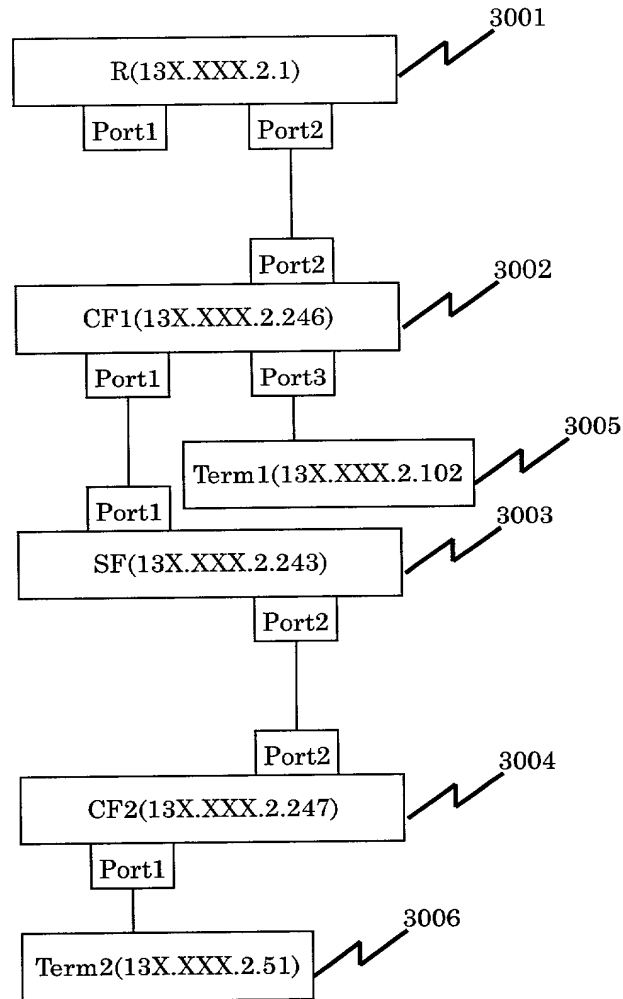


Fig. 31

TS Table Entry for Use in Detection of Vertical Dependency through Combination of  
A plurality of Models

Terminal IP Address	Terminal Mac Address	Terminal Port	Parent IP Address	Parent Mac Address	Parent Port
...	...	...	...	...	...
13X.XXX.2.243	00:00:f4:71:01:37	1	13X.XXX.2.246	08:00:4e:4f:ad:27	1
13X.XXX.2.247	00:00:81:39:df:aa	2	13X.XXX.2.246	08:00:4e:4f:ad:27	1
13X.XXX.2.243	00:00:f4:71:01:37	2	13X.XXX.2.247	00:00:81:39:df:aa	2
13X.XXX.2.247	00:00:81:39:df:aa	2	13X.XXX.2.243	00:00:f4:71:01:37	2
...	...	...	...	...	...

[Conditions]

- ① when connection is detectable and vertical dependency is not, TS table stores two symmetric entries to indicate this (13X.XXX.2.243 and 13X.xxx.2.247 connected to each other at Port2; vertical dependency unknown)
- ② both 13X.XXX.2.243 and 13X.XXX.2.247 are child devices of 13X.XXX.2.246, connected through Port1 and Port2, respectively
- ③ then, 13X.XXX.2.243 is a parent to 13X.XXX.2.247
  - given that 13X.XXX.2.243 is a parent, a contradiction occurs since 13X.XXX.2.246 can be connected via both Port1 and Port2 of 13X.XXX.2.243
  - a contradiction also occurs on the assumption that 13X.XXX.2.243 and 13X.XXX.2.247 are connected to a non intelligent hub and horizontally dependent on each other

# Fig. 32

Method of Predicting Connection of Non Intelligent Hub

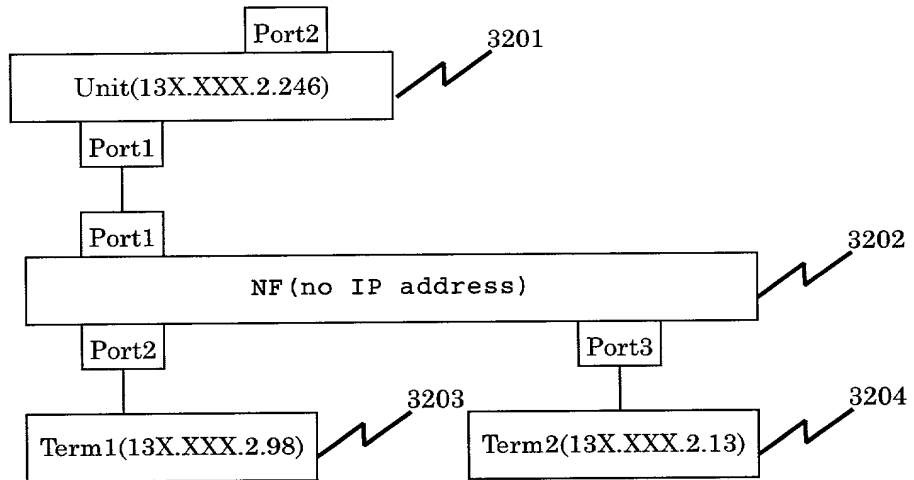


Fig. 33

625

TS Table Entry for Use in Prediction of Non Intelligent Hub Connection

Terminal IP Address	Terminal Mac Address	Terminal Port	Parent IP Address	Parent Mac Address	Parent Port
...	...	...	...	...	...
13X.XXX.2.98	00:60:97:0f:69:e4	—	13X.XXX.2.246	08:00:4e:4f:ad:27	1
13X.XXX.2.13	08:00:09:e1:51:5e	—	13X.XXX.2.246	08:00:4e:4f:ad:27	1
...	...	...	...	...	...

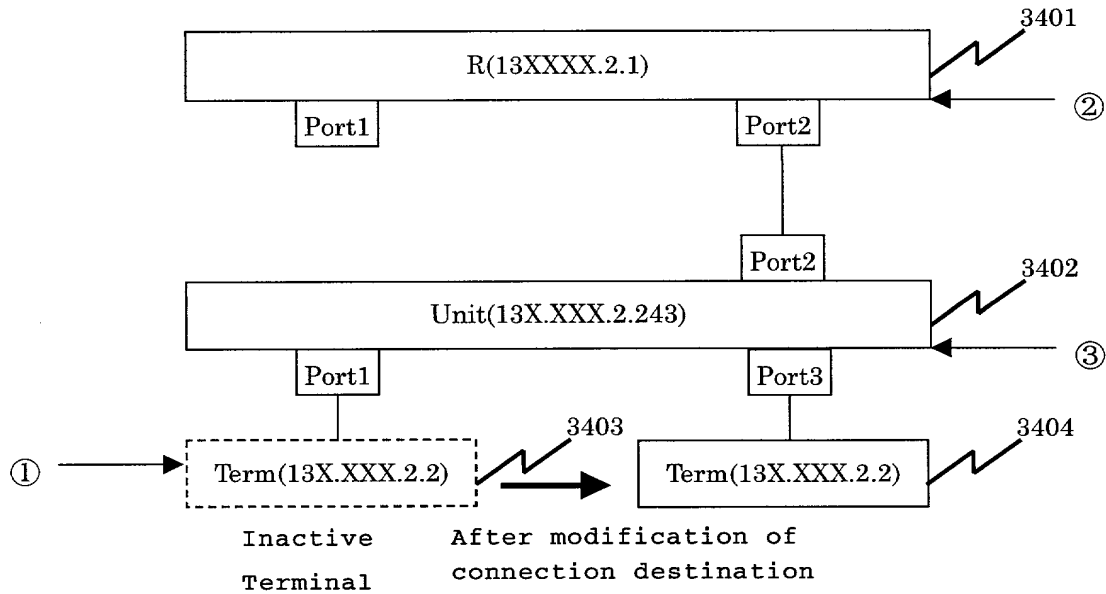
3301

3302



# Fig. 34

Detection of Inactive Terminal and Connection Destination Modification



## [Conditions]

- ① inactive terminal (133.108.2.2) returns no response to polling, making FALSE the alive value in corresponding entry in TI table
- ② an entry of inactive terminal (133.108.2.2) is cached in APR table of Router, allowing creation of AT table entry
- ③ connection information of inactive terminal (133.108.2.2) is cached in packet relay equipment (133.108.2.243) to which the terminal is connected, allowing creation of PF and TS table entries

# Fig. 35

625

TS Table Entry for Use in Detection of Connection Destination Modification

Terminal IP Address	Terminal Mac Address	Terminal Port	Parent IP Address	Parent Mac Address	Parent Port
...	...	...	...	...	...
13X.XXX.2.2	08:00:20:a13X:ab	—	13X.XXX.2.243	00:00:f4:71:01:37	2
...	...	...	...	...	...

3501

↓ After modification of connection destination

Terminal IP Address	Terminal Mac Address	Terminal Port	Parent IP Address	Parent Mac Address	Parent Port
...	...	...	...	...	...
13X.XXX.2.2	08:00:20:a13X:ab	—	13X.XXX.2.243	00:00:f4:71:01:37	2
13X.XXX.2.2	08:00:20:a13X:ab	—	13X.XXX.2.243	00:00:f4:71:01:37	3
...	...	...	...	...	...

3502

3503

Fig.36

Example of Network Configuration Chart Display

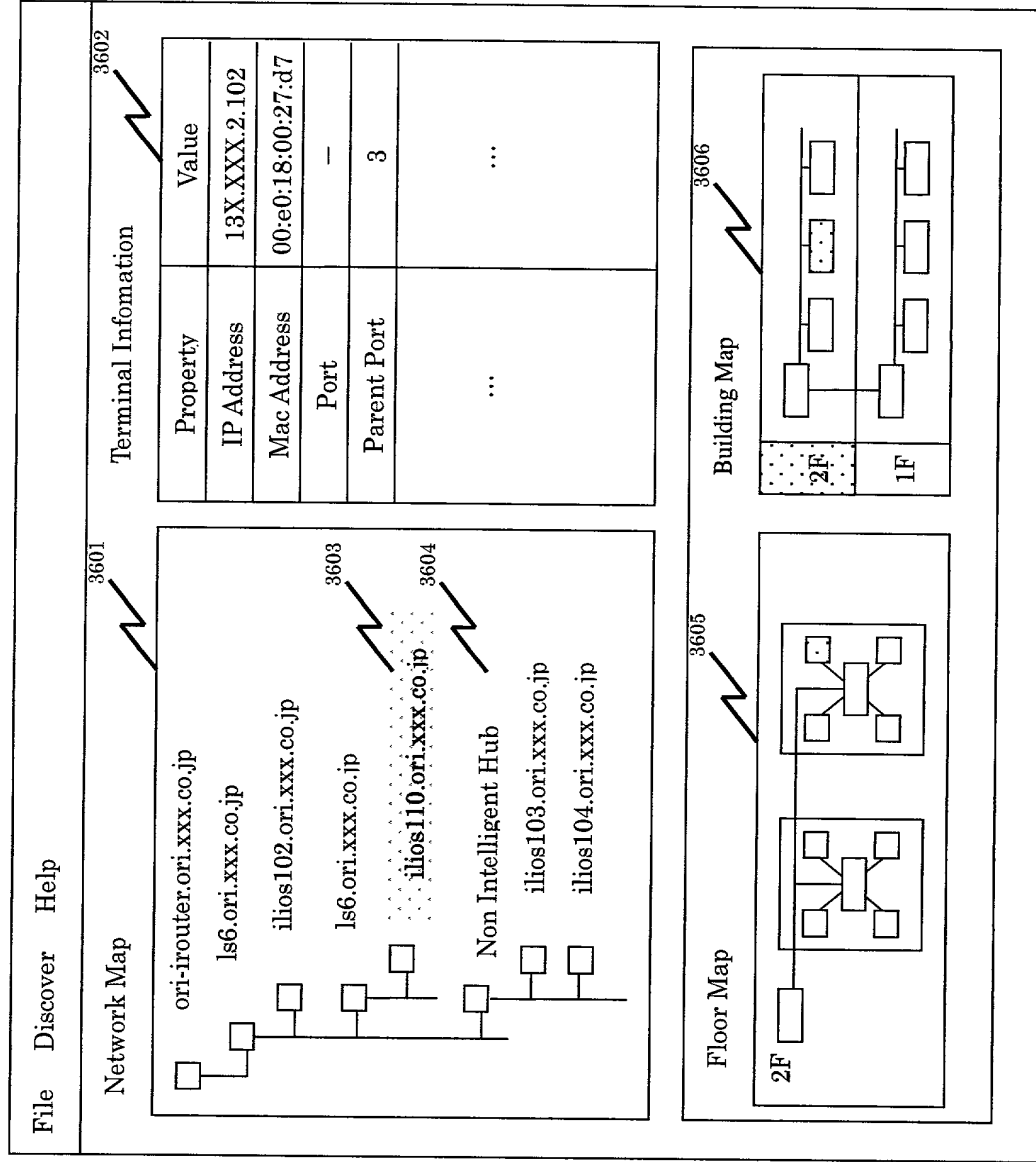


Fig. 37 (a)

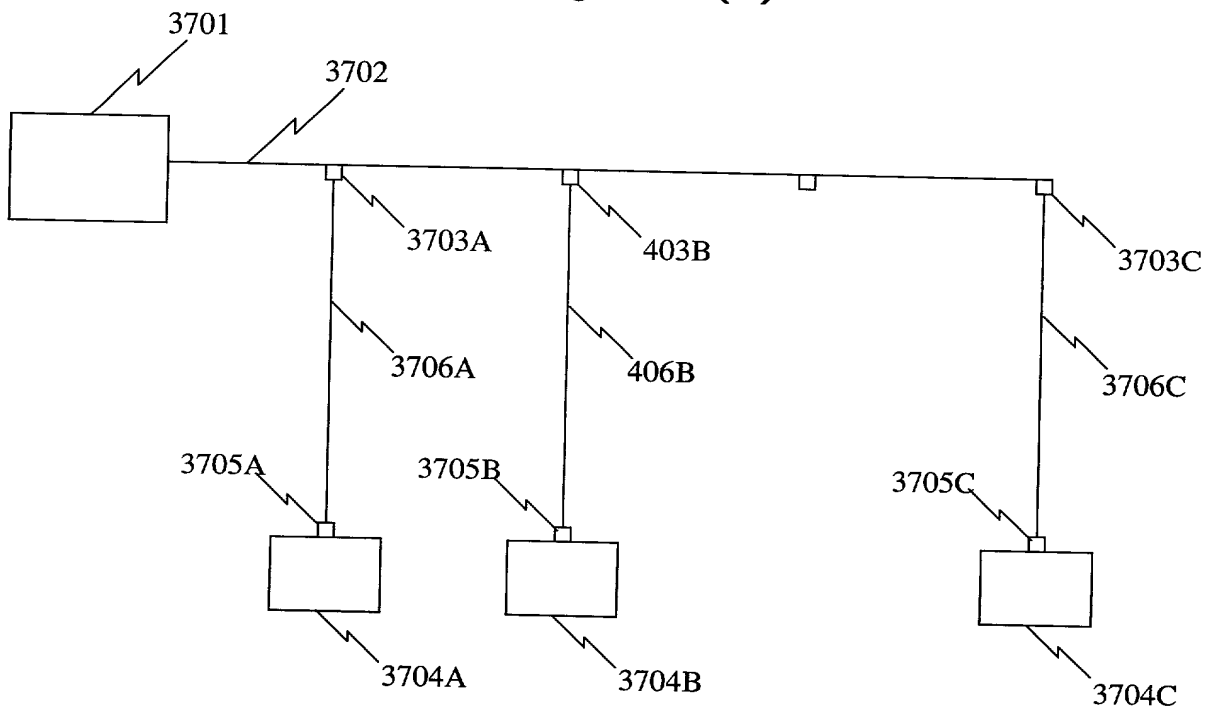


Fig. 37 (b)

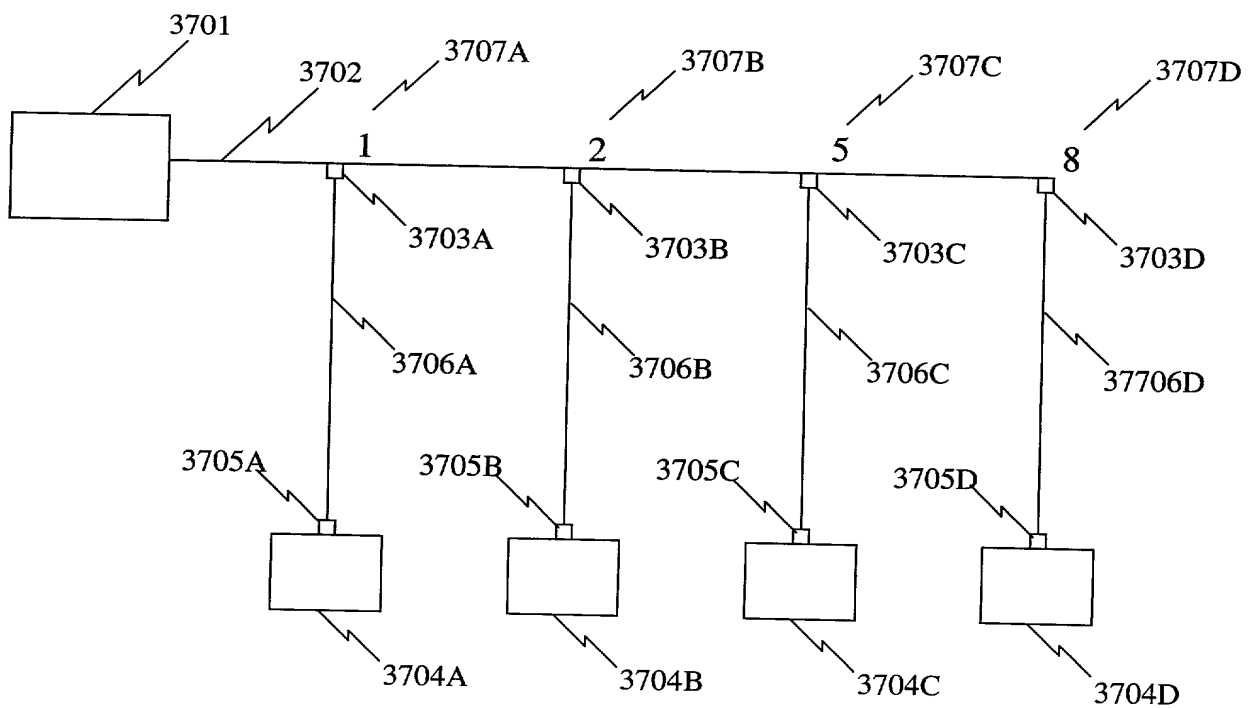


Fig. 38

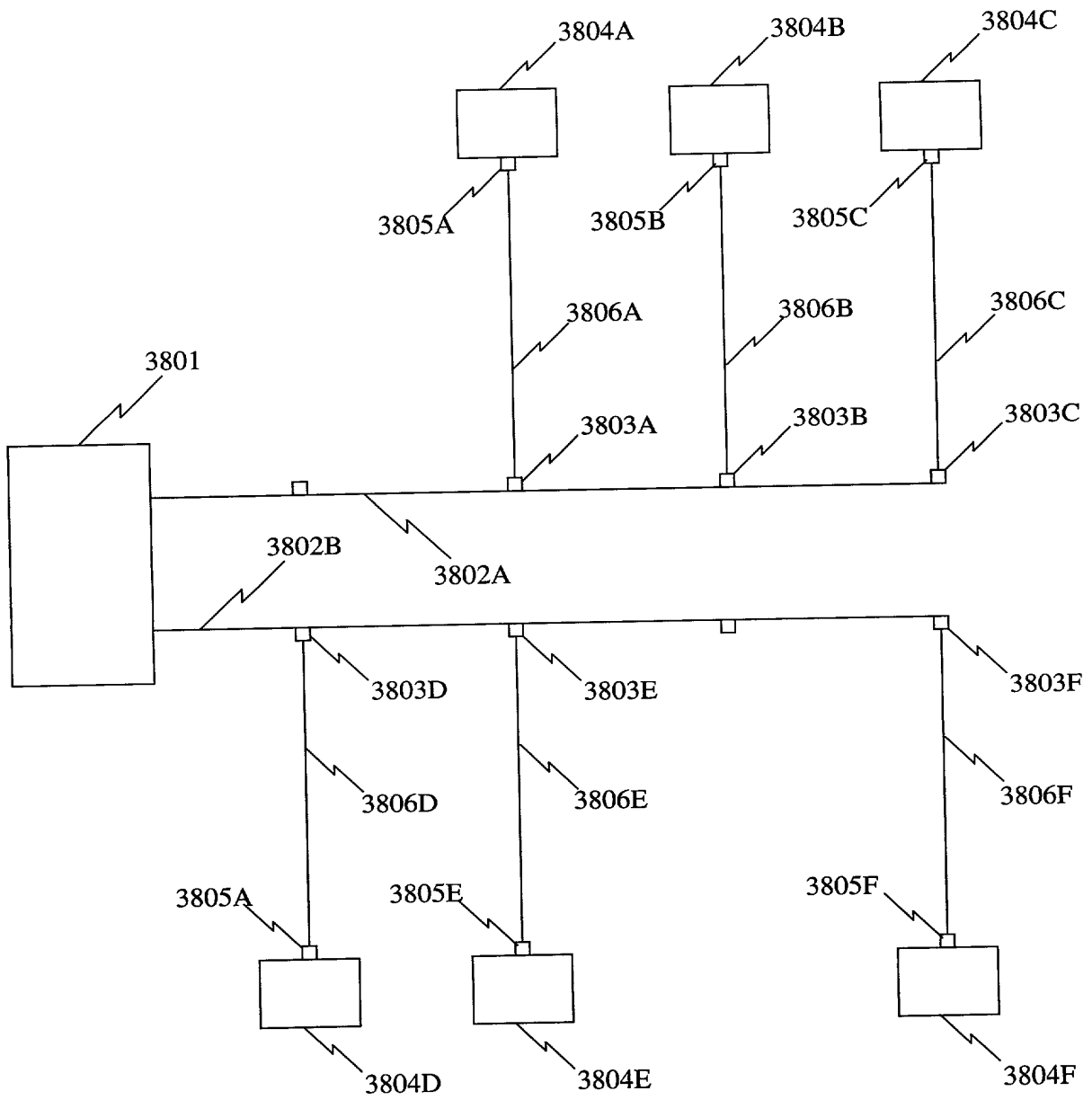


Fig. 39

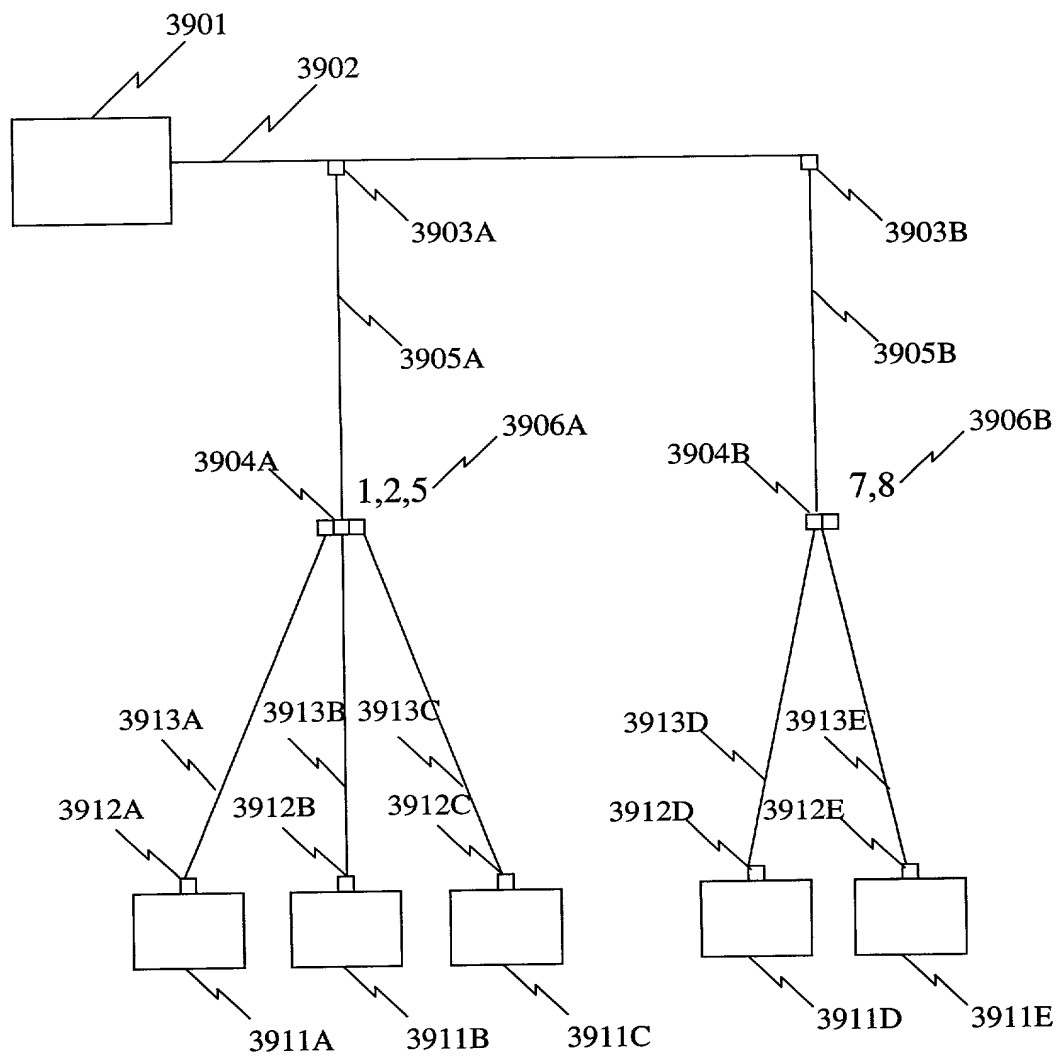


Fig. 40 (a)

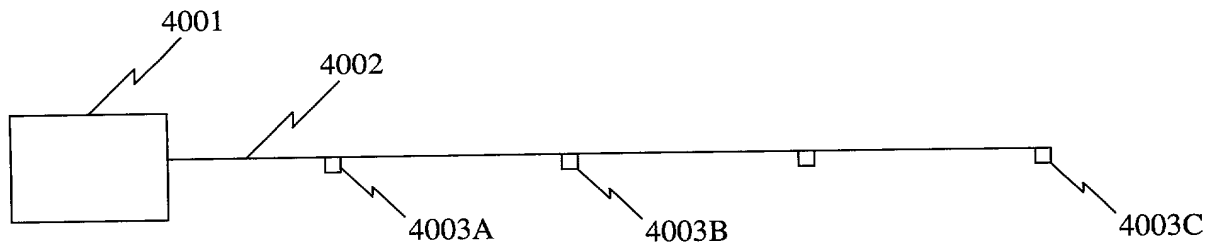


Fig. 40 (b)

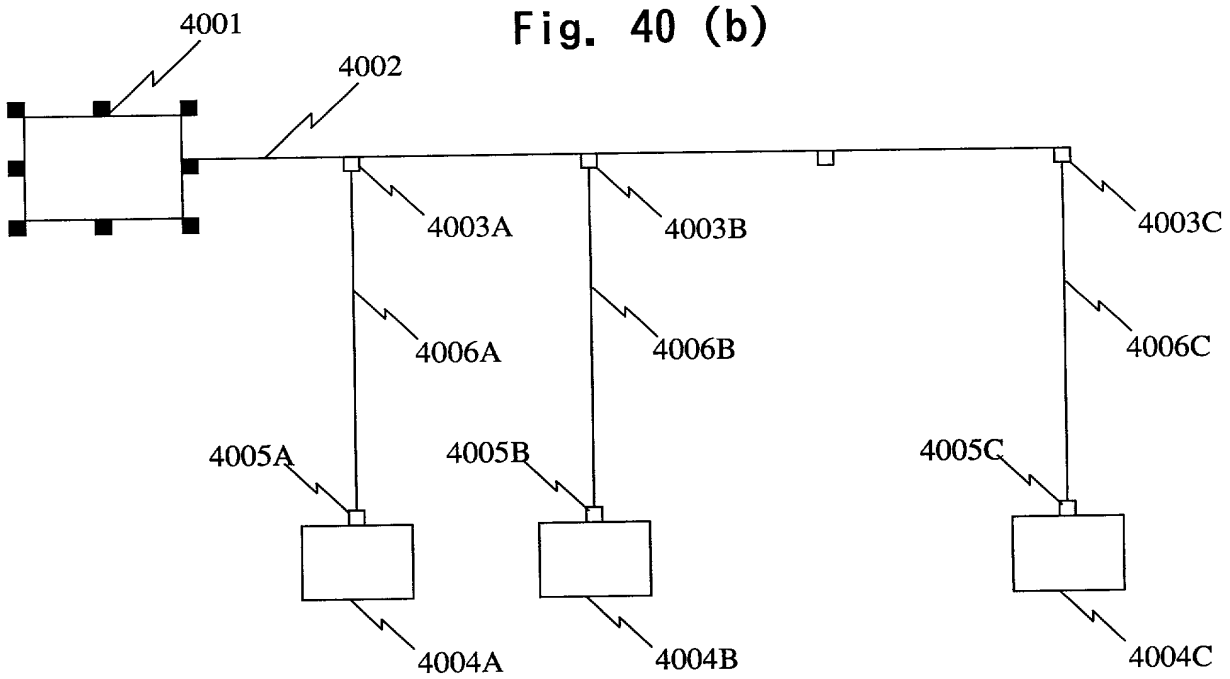


Fig. 41

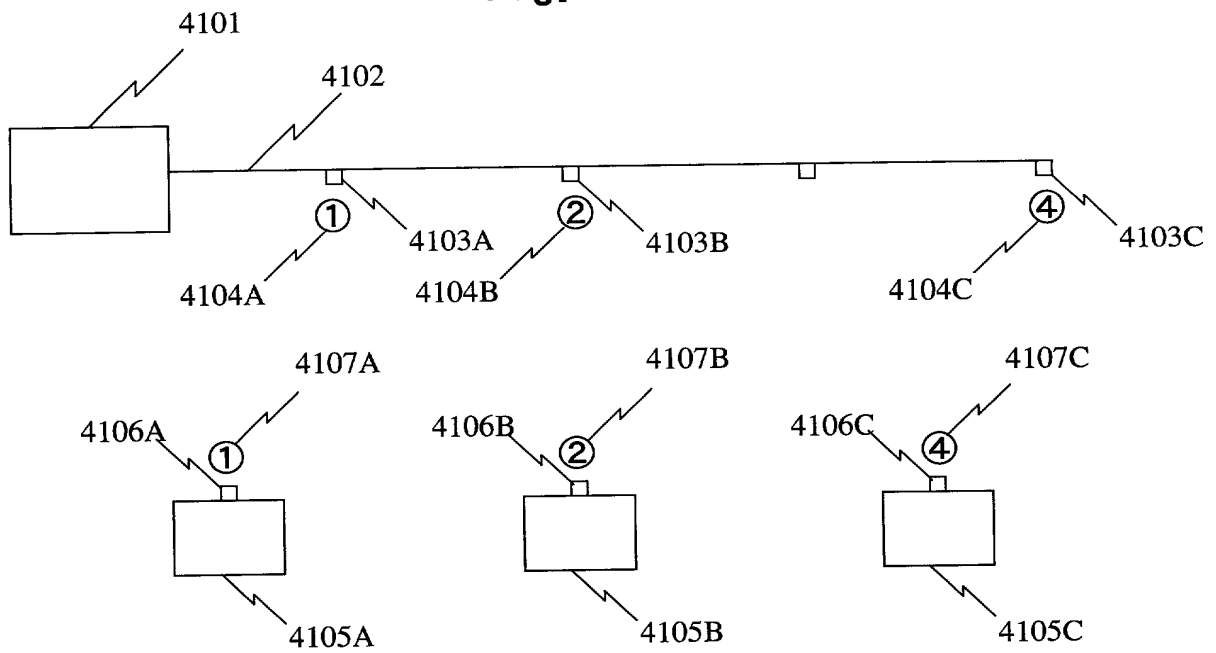


Fig. 42

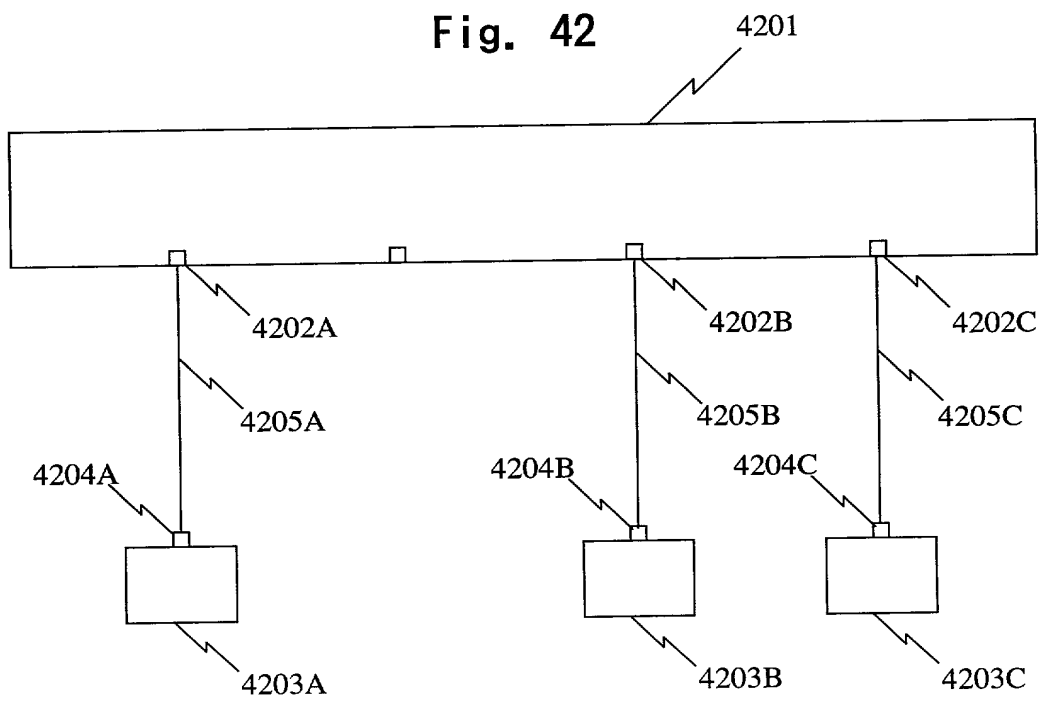




Fig. 43

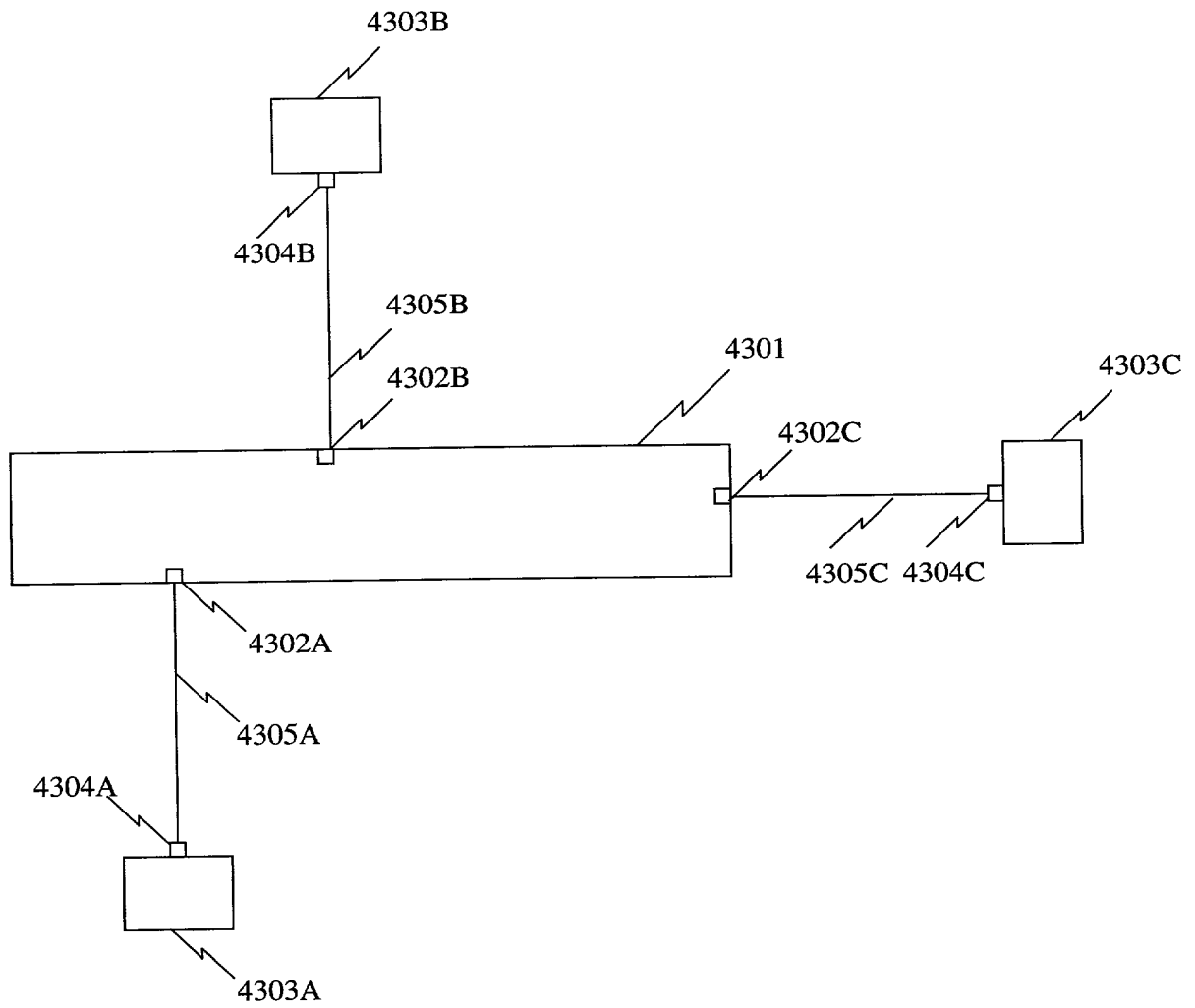


Fig. 44

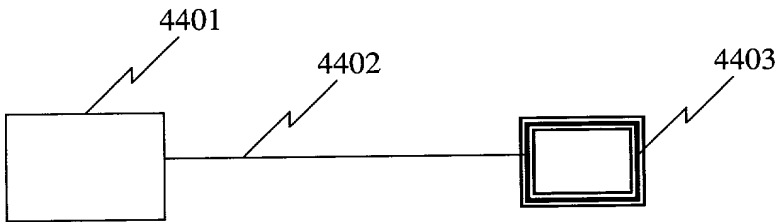


Fig. 45

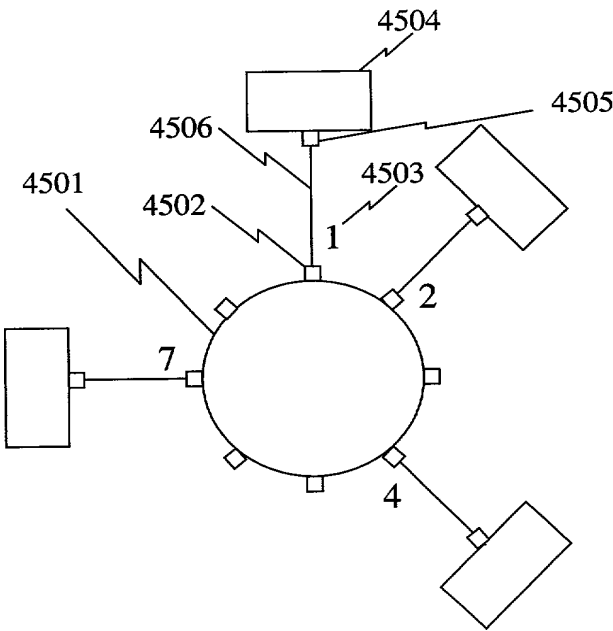


Fig. 46 (a)

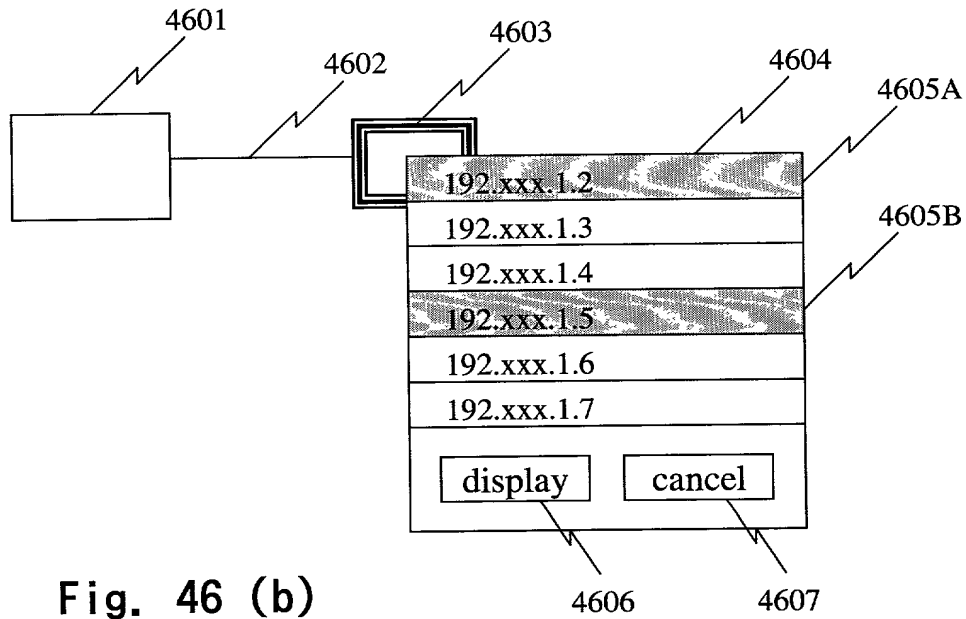


Fig. 46 (b)

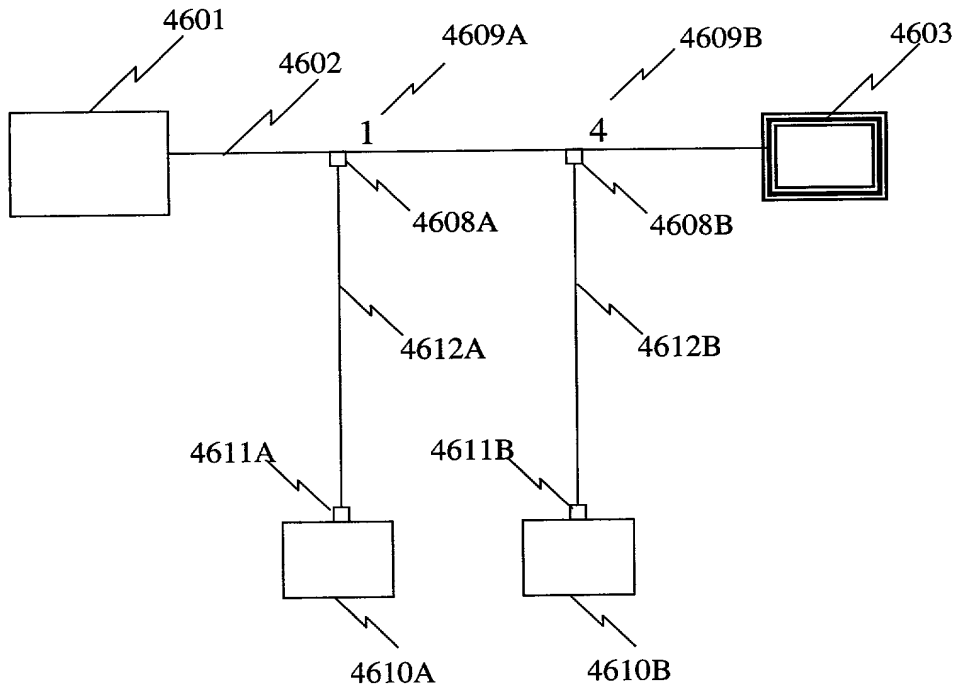


Fig. 47

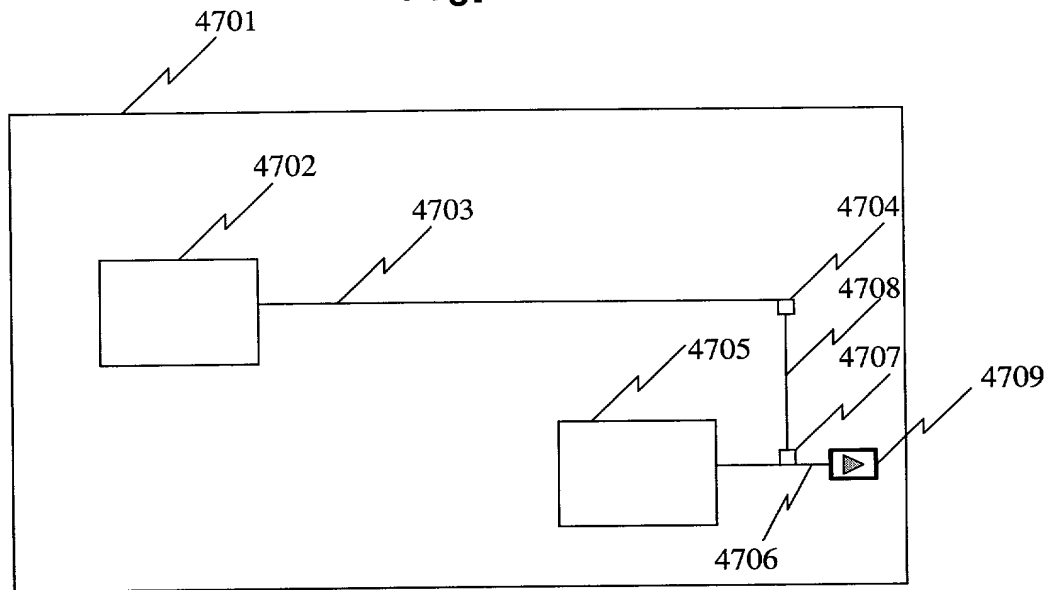


Fig. 48 (a)

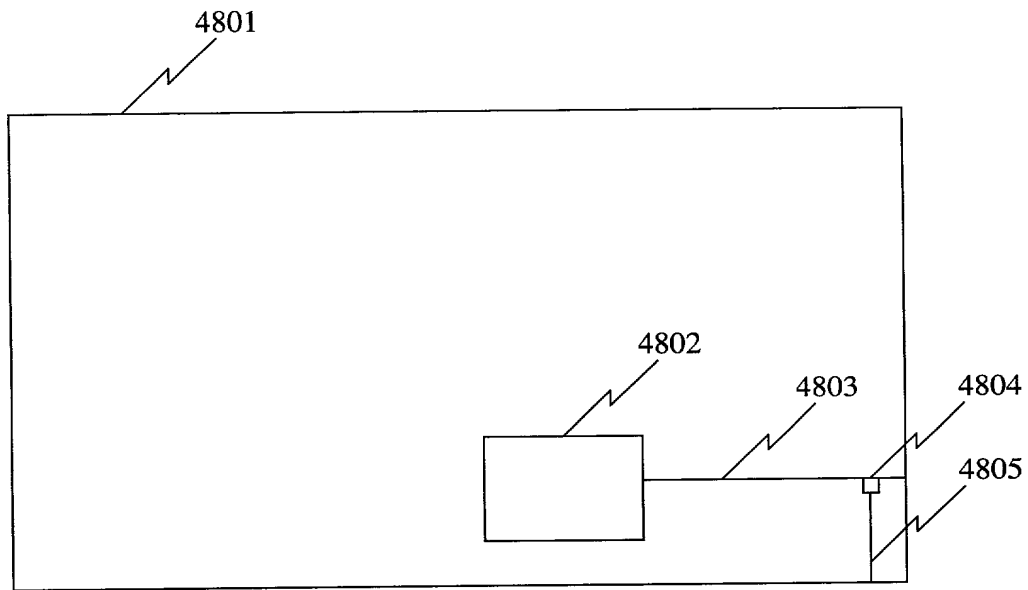


Fig. 48 (b)

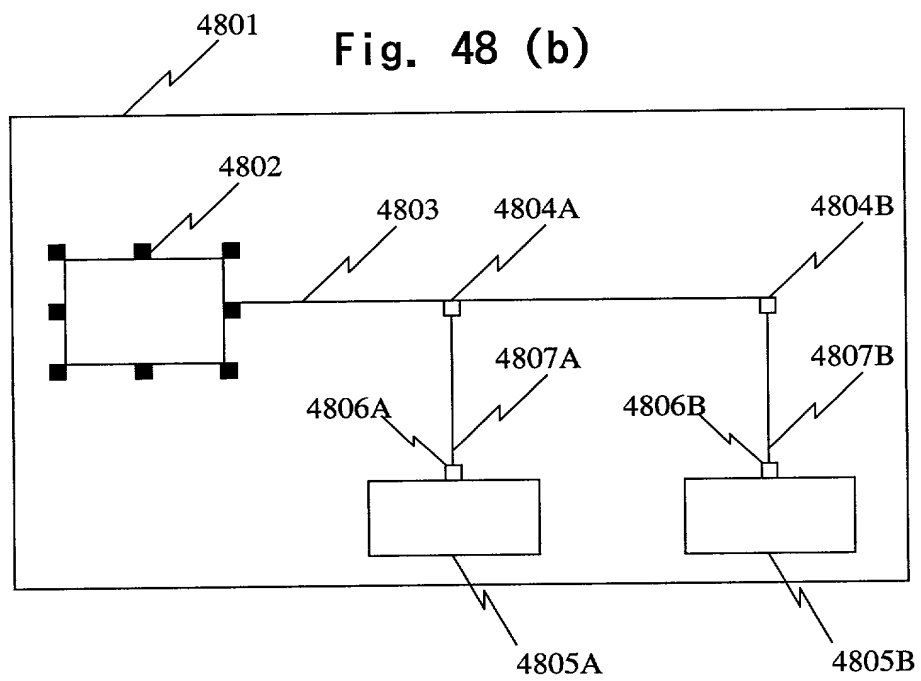


Fig. 49 (a)

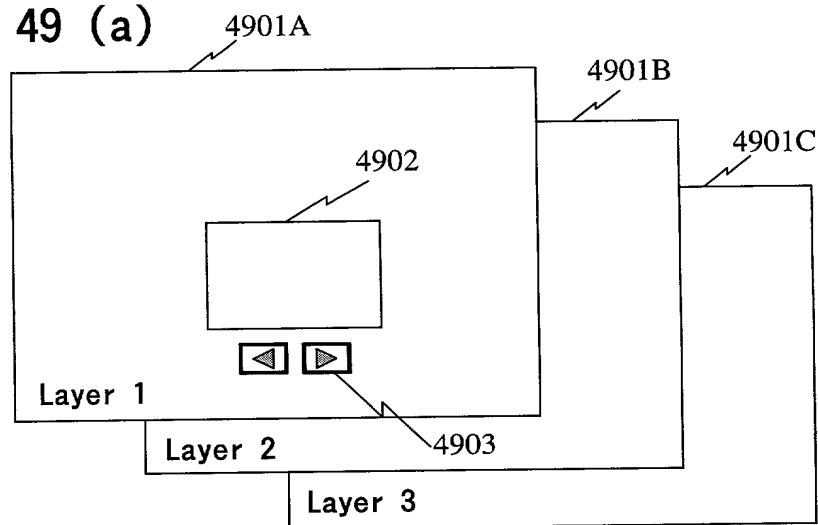


Fig. 49 (b)

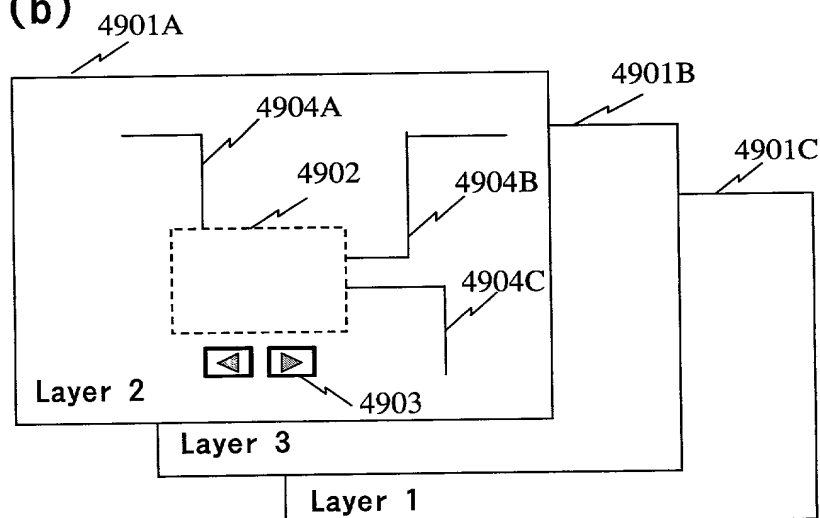


Fig. 49 (c)

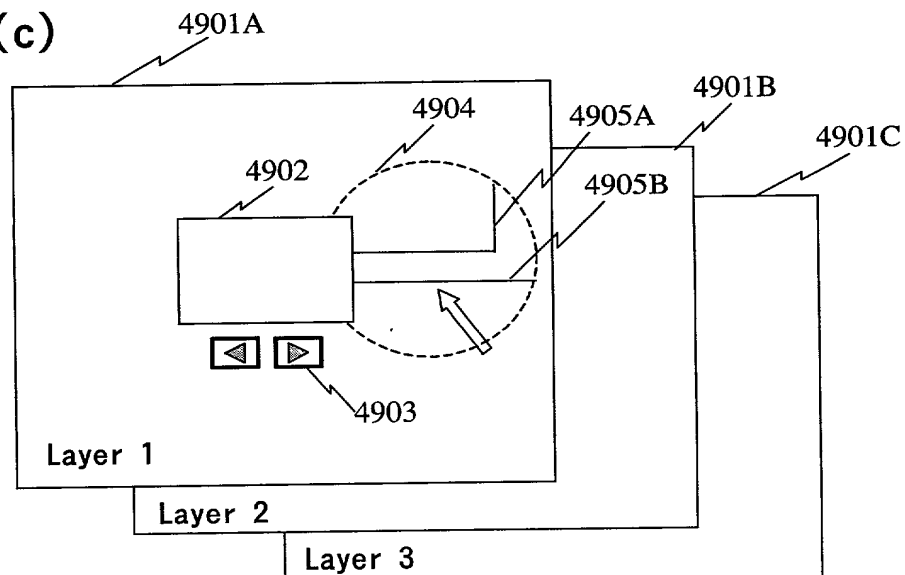
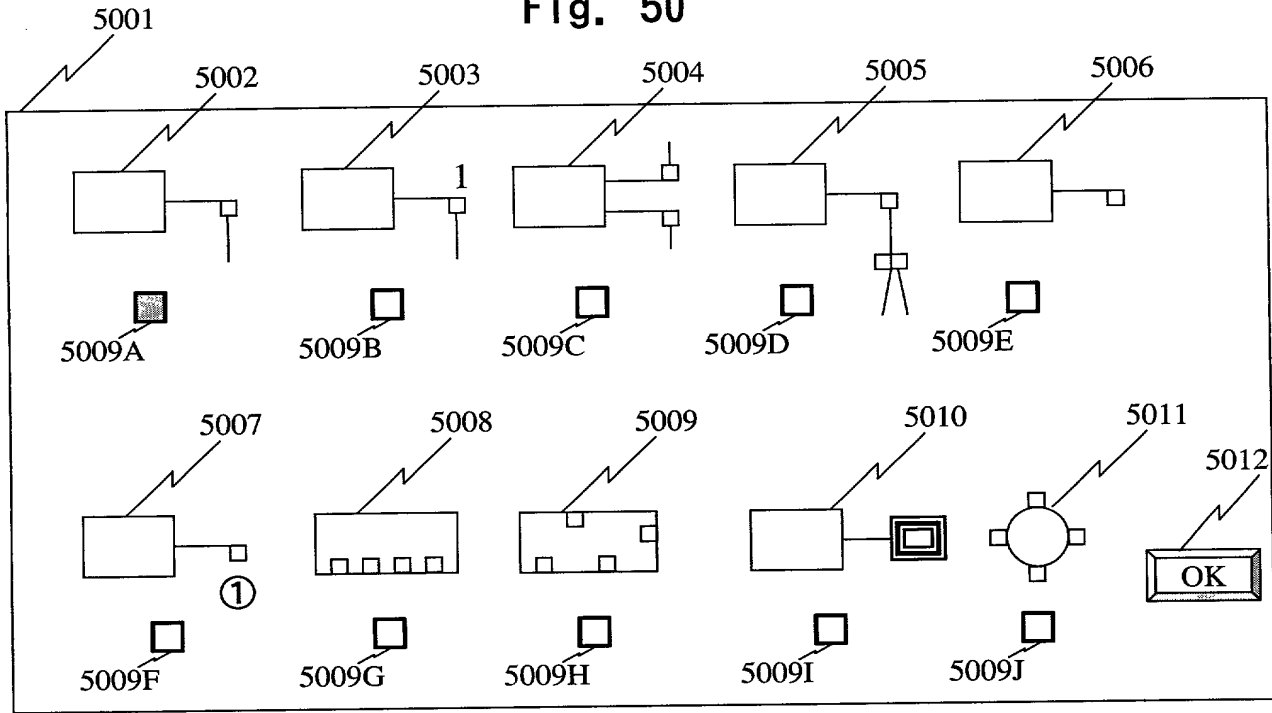
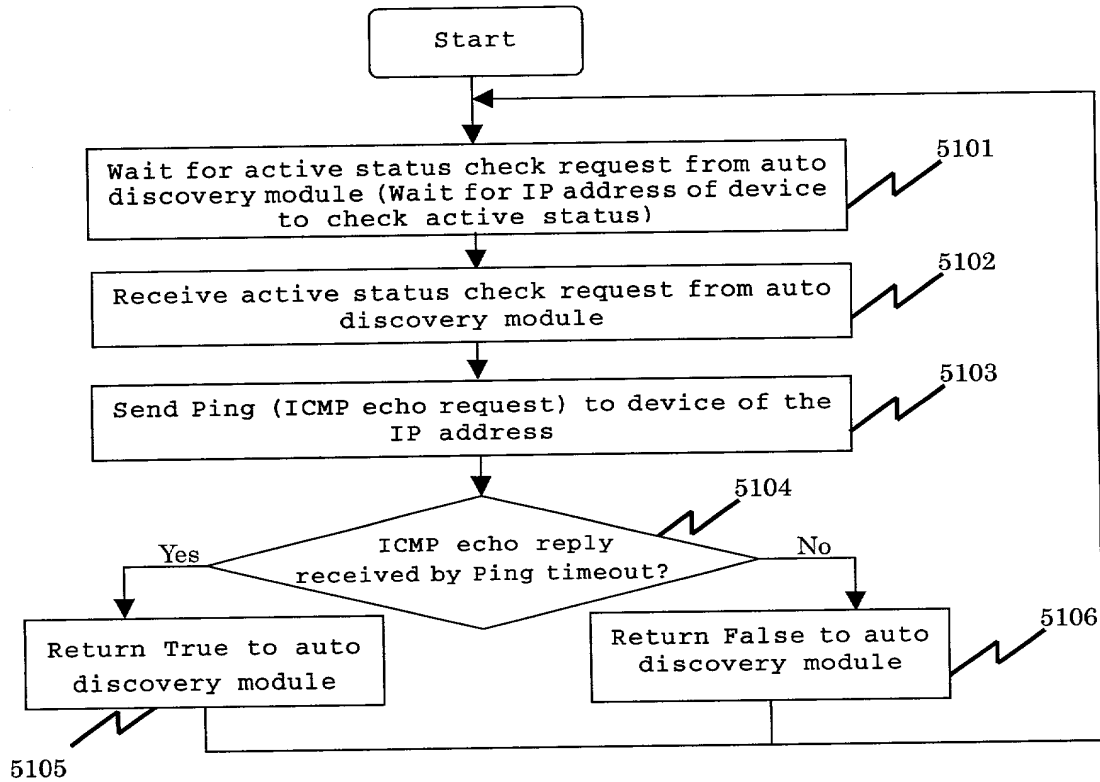


Fig. 50



# Fig. 51

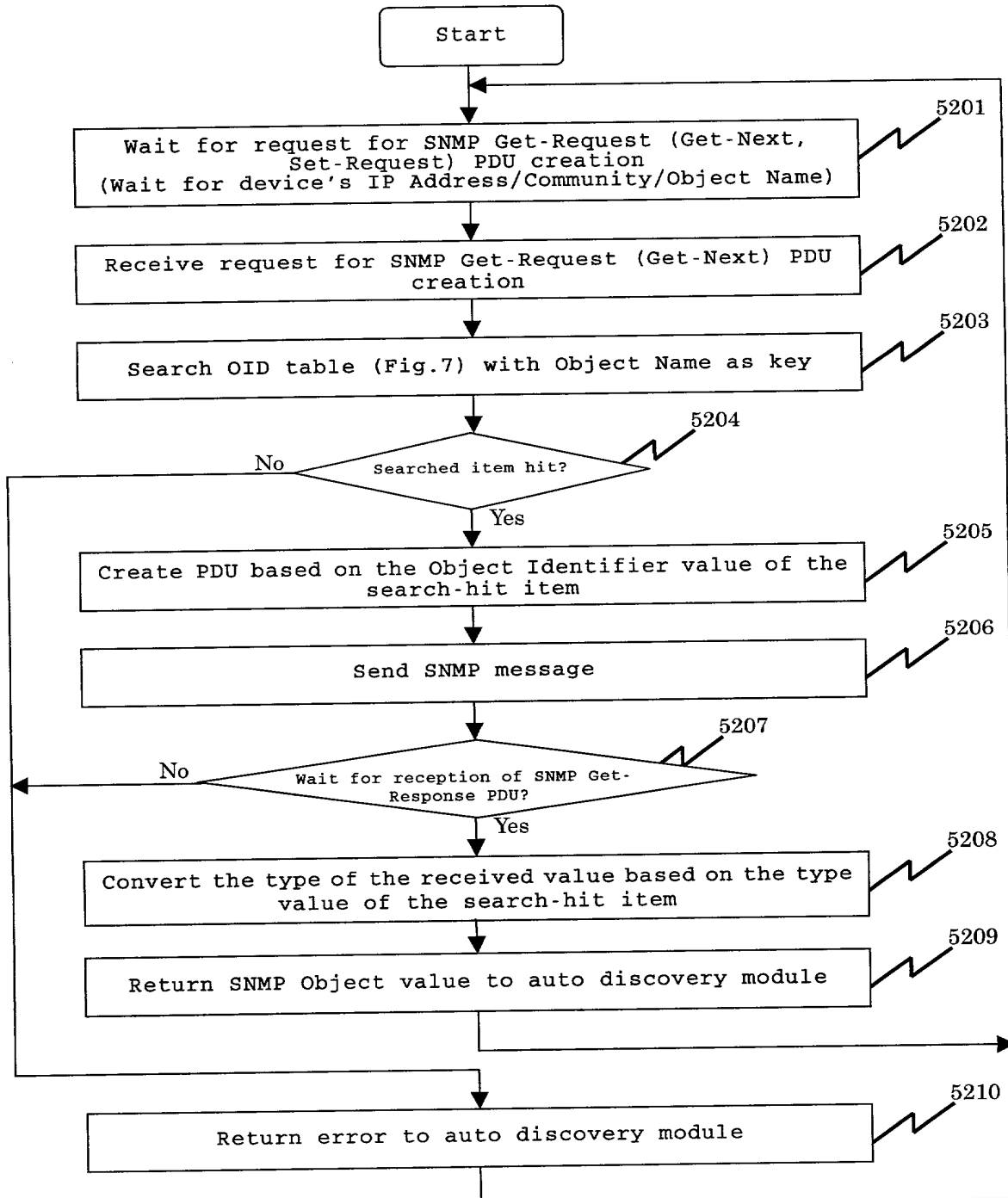
Operation Flowchart for Active Status Detection Module  
(Active Status Detection Process through Sending/Receiving of ICMP Echo Requests)





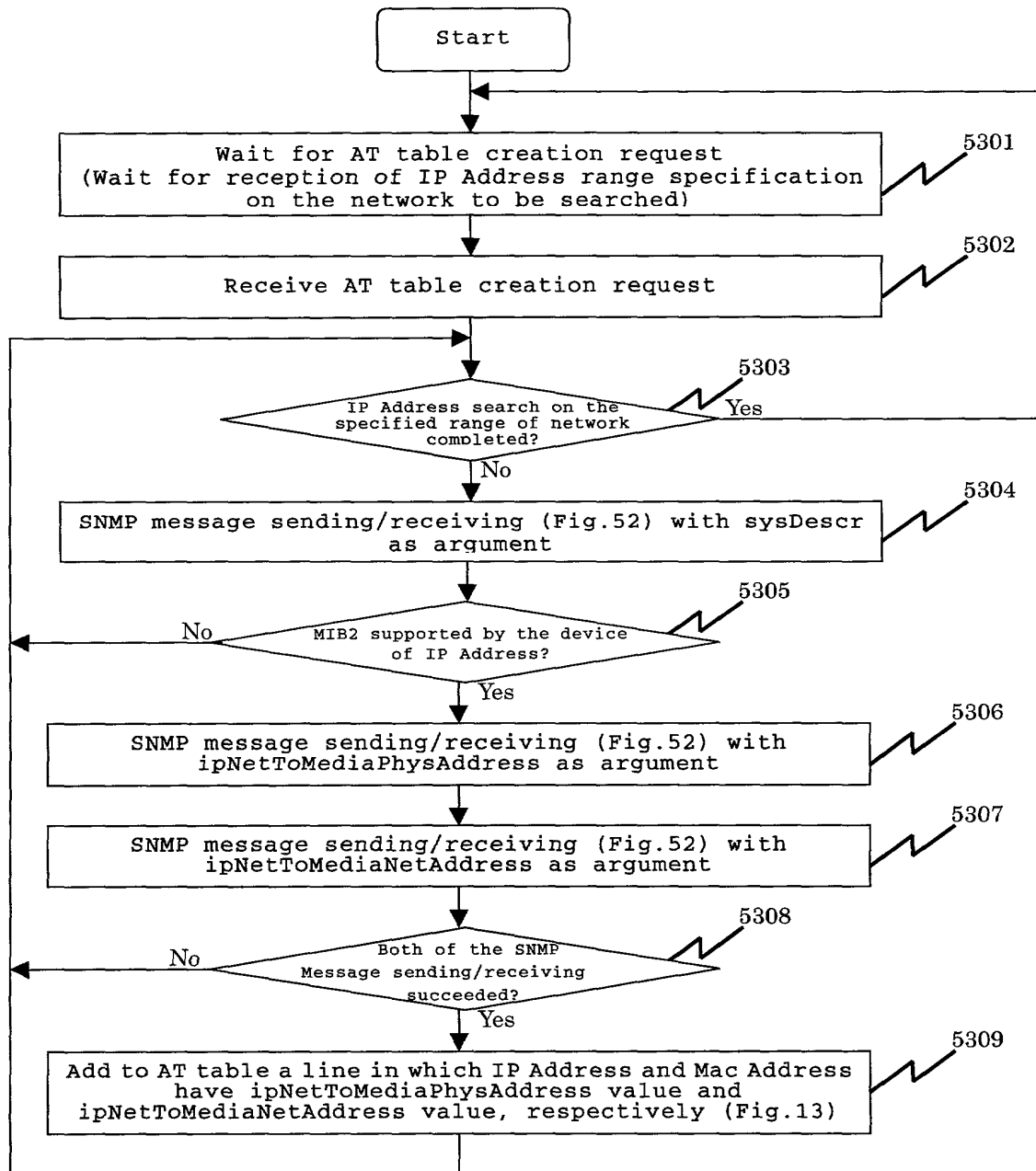
# Fig. 52

Operation Flowchart for MIB Access Module  
(Process of Creating PDUs (Protocol Data Units) and Sending/Receiving SNMP Messages)



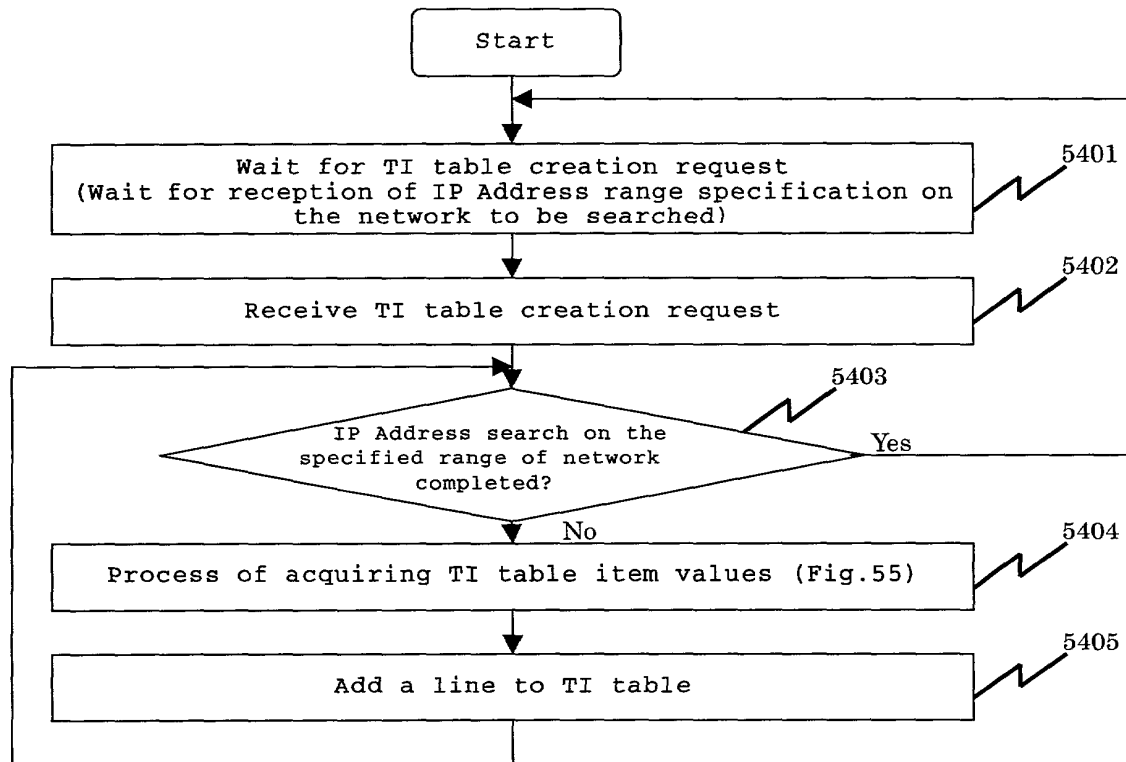
# Fig. 53

Operation Flowchart 1 for Auto Discovery Module  
(Process for AT Table Creation)



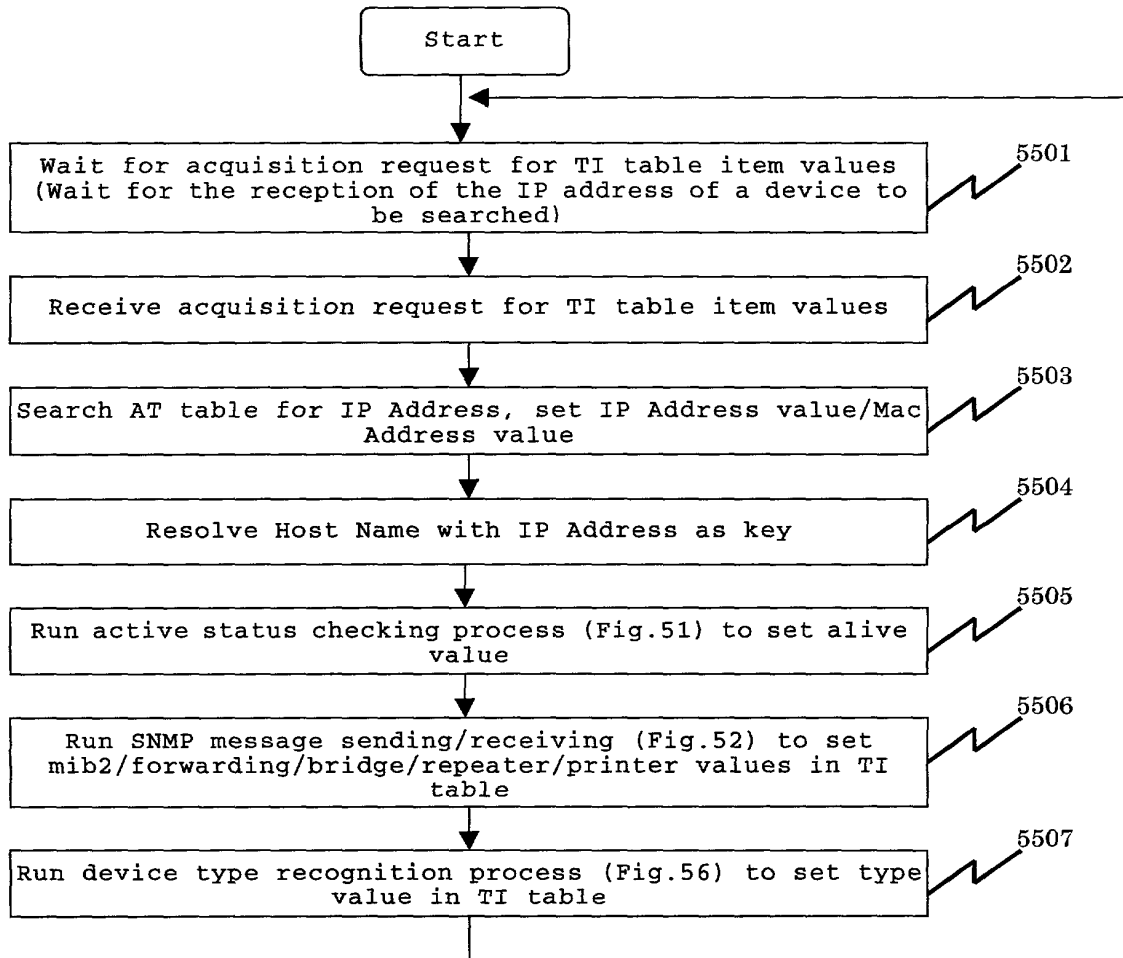
# Fig. 54

Operation Flowchart 2 for Auto Discovery Module  
(Process for TI Table Creation)



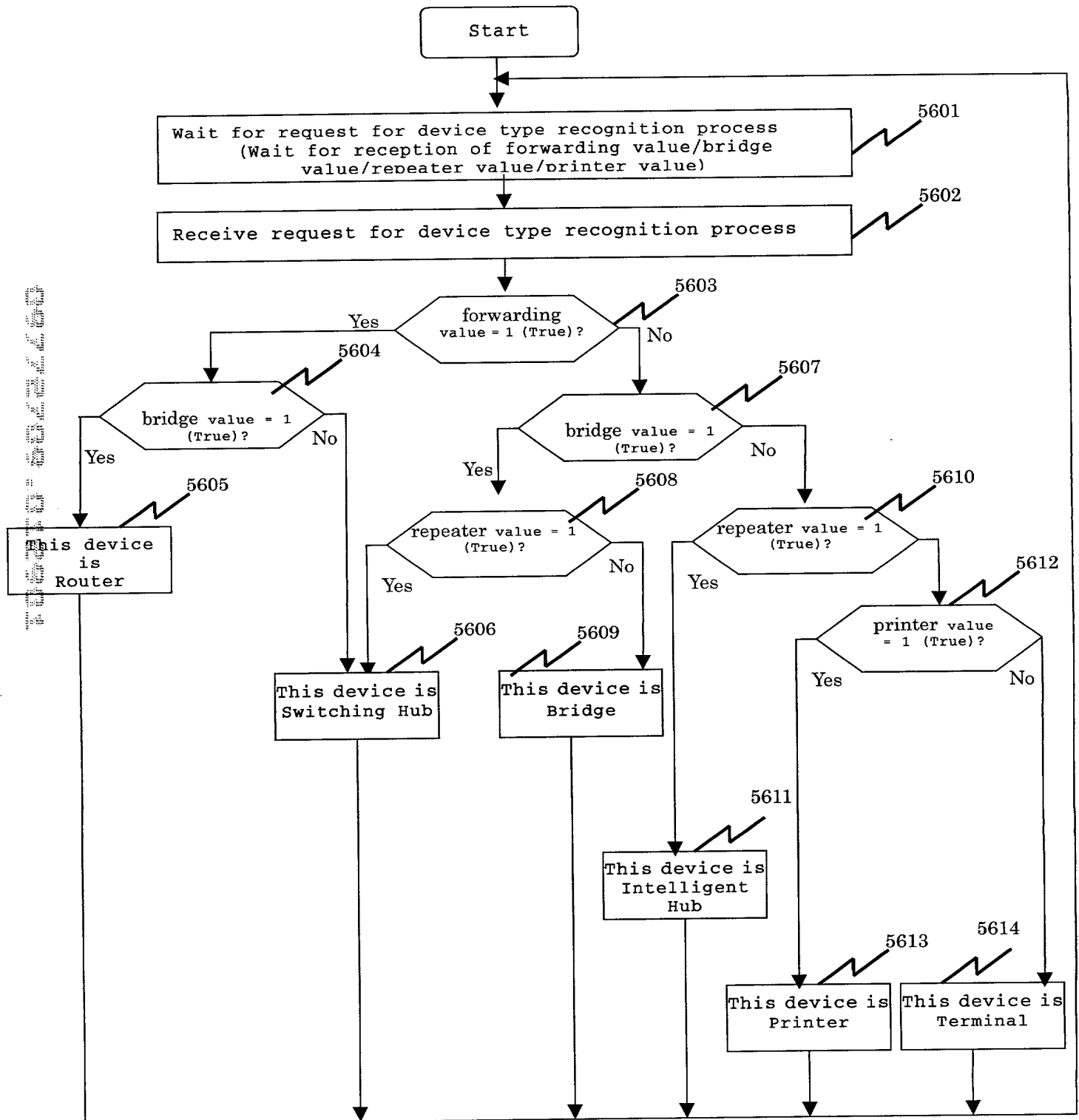
# Fig. 55

Operation Flowchart 3 for Auto Discovery Module  
(TI Table Creation (Process of Acquiring TI Table Item Values))



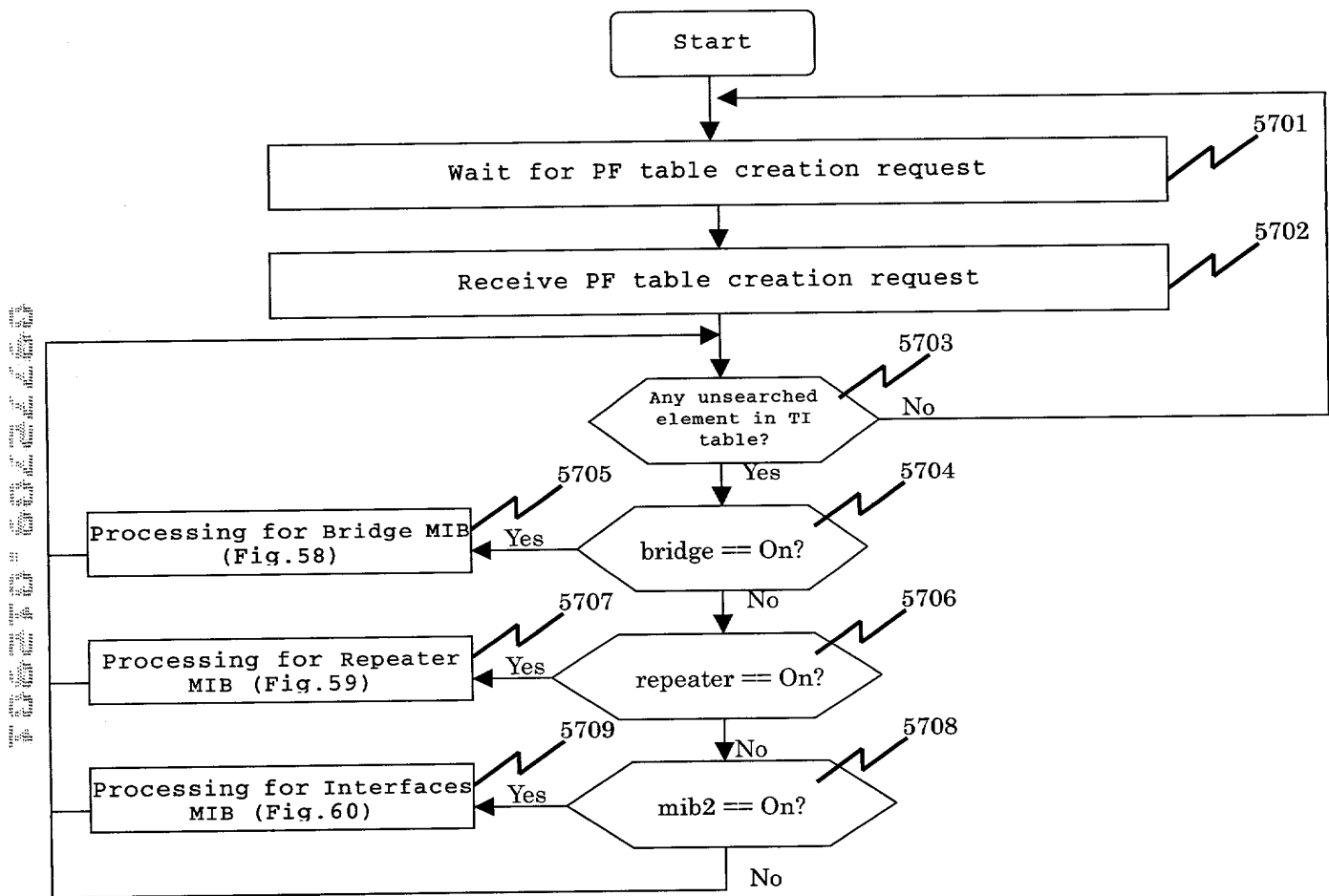
# Fig. 56

Operation Flowchart 4 for Auto Discovery Module  
(Process of Acquiring TI Table ITEM Value  
(Device Type Recognition Process (Fig.13)))



# Fig. 57

Operation Flowchart 5 for Auto Discovery Module  
(Process for PF Table Creation)



# Fig. 58

Operation Flowchart 6 for Auto Discovery Module  
(PF Table Creation (Processing for Bridge MIB))

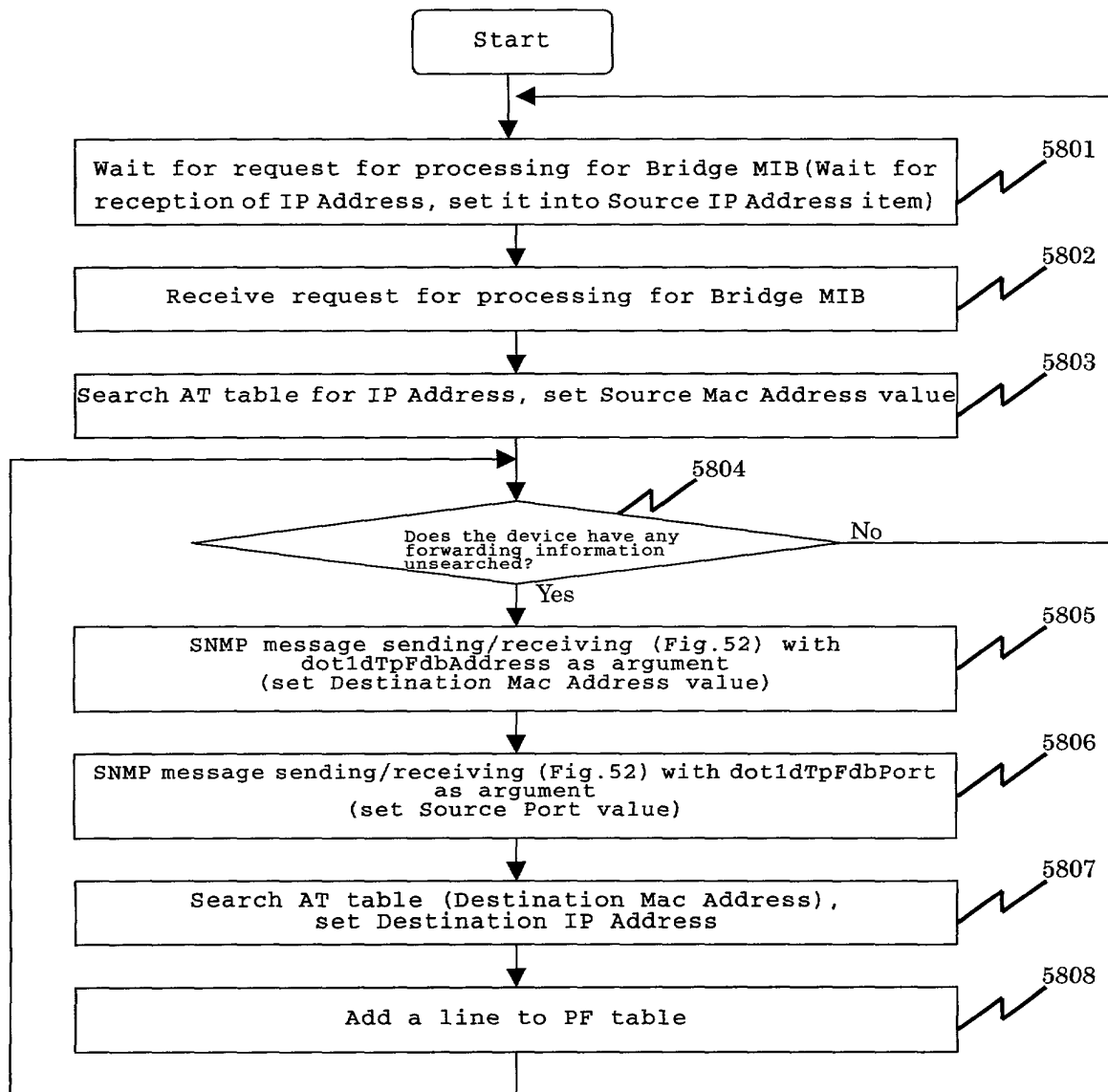


Fig. 59

Operation Flowchart 7 for Auto Discovery Module  
(PF Table Creation (Processing for Repeater MIB))

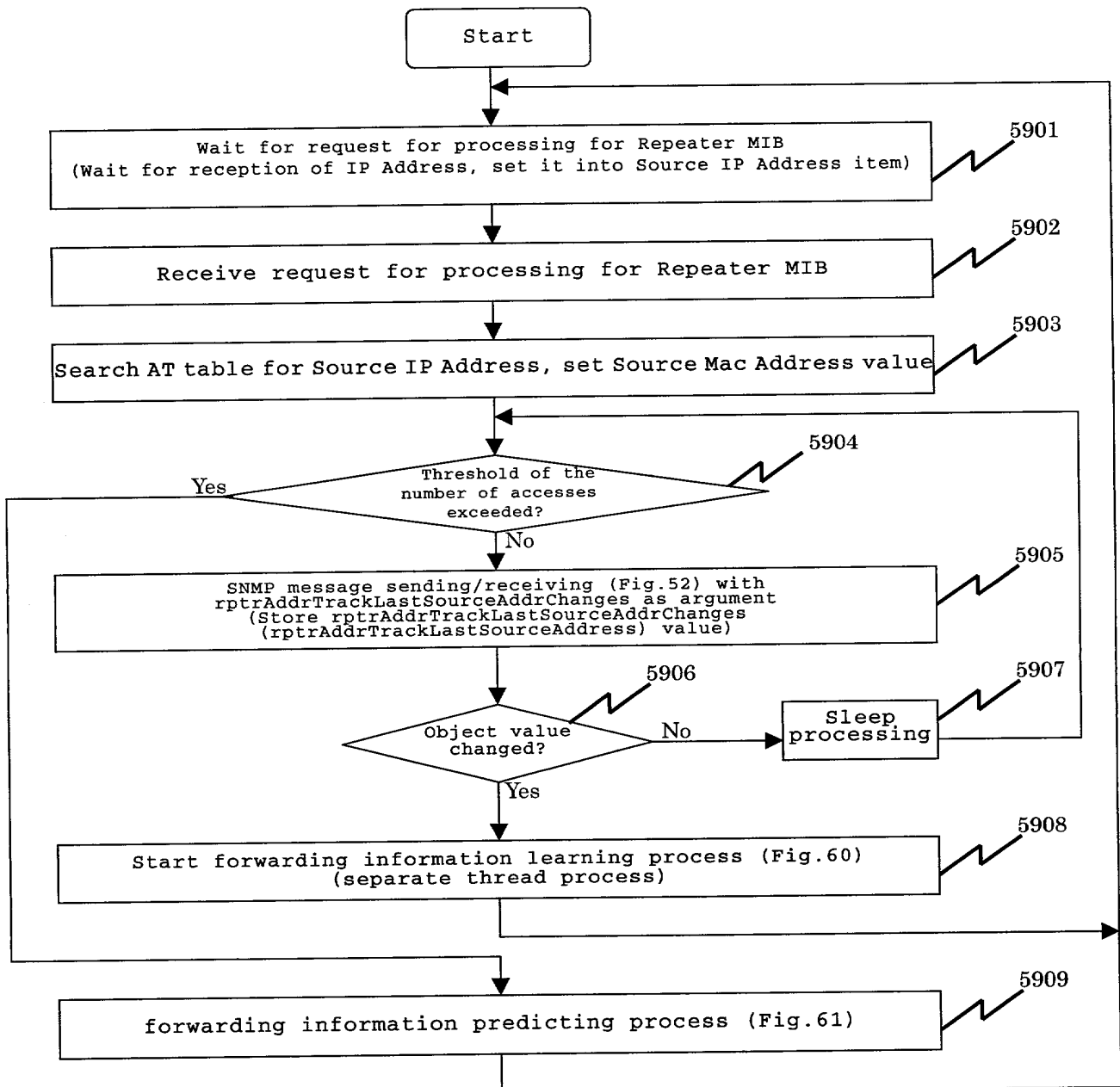




Fig. 60

Operation Flowchart 8 for Auto Discovery Module  
(Processing for Repeater MIB (Forwarding Information Learning process))

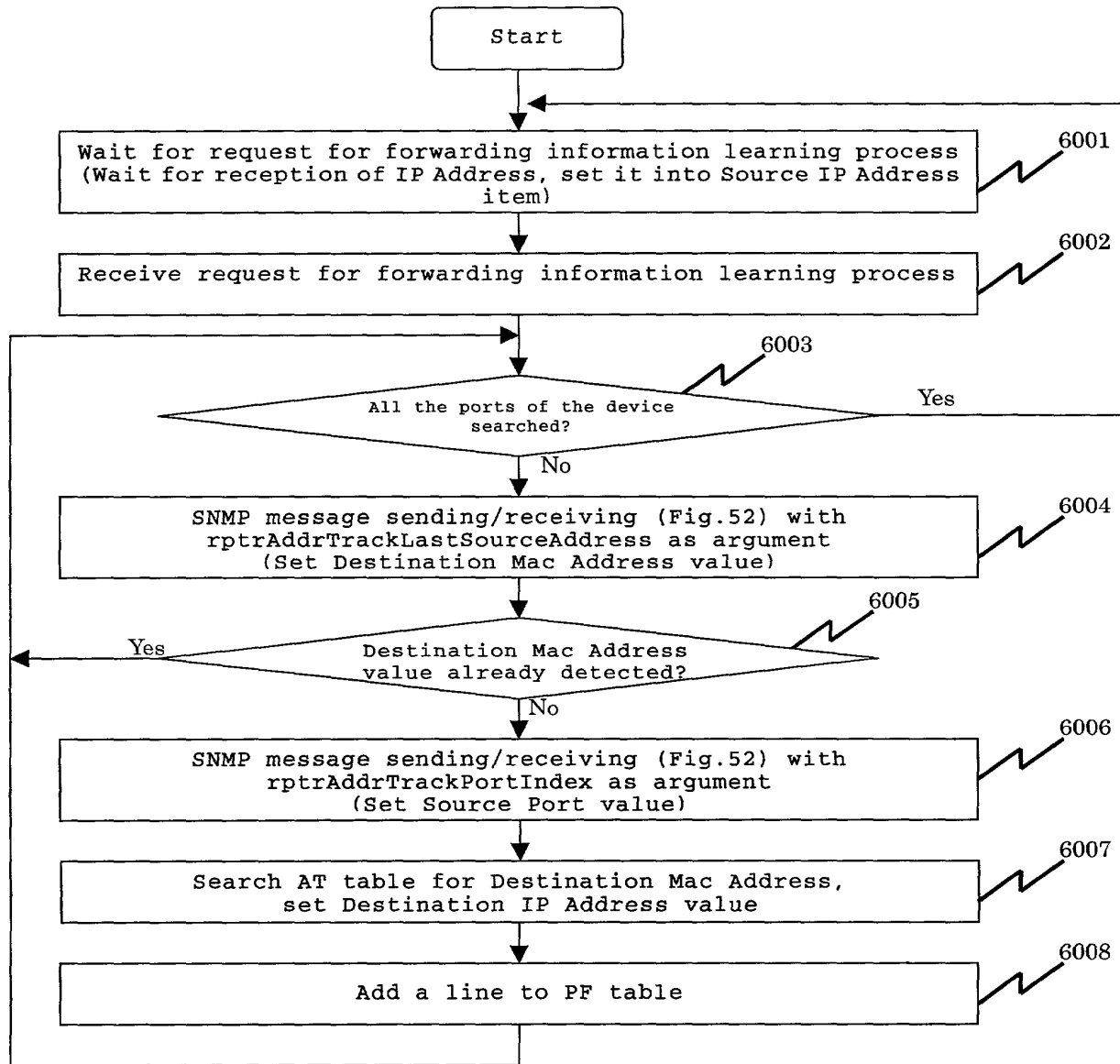


Fig. 61

Operation Flowchart 9 for Auto Discovery Module  
(Processing for Repeater MIB (Forwarding Information Predicting Process))

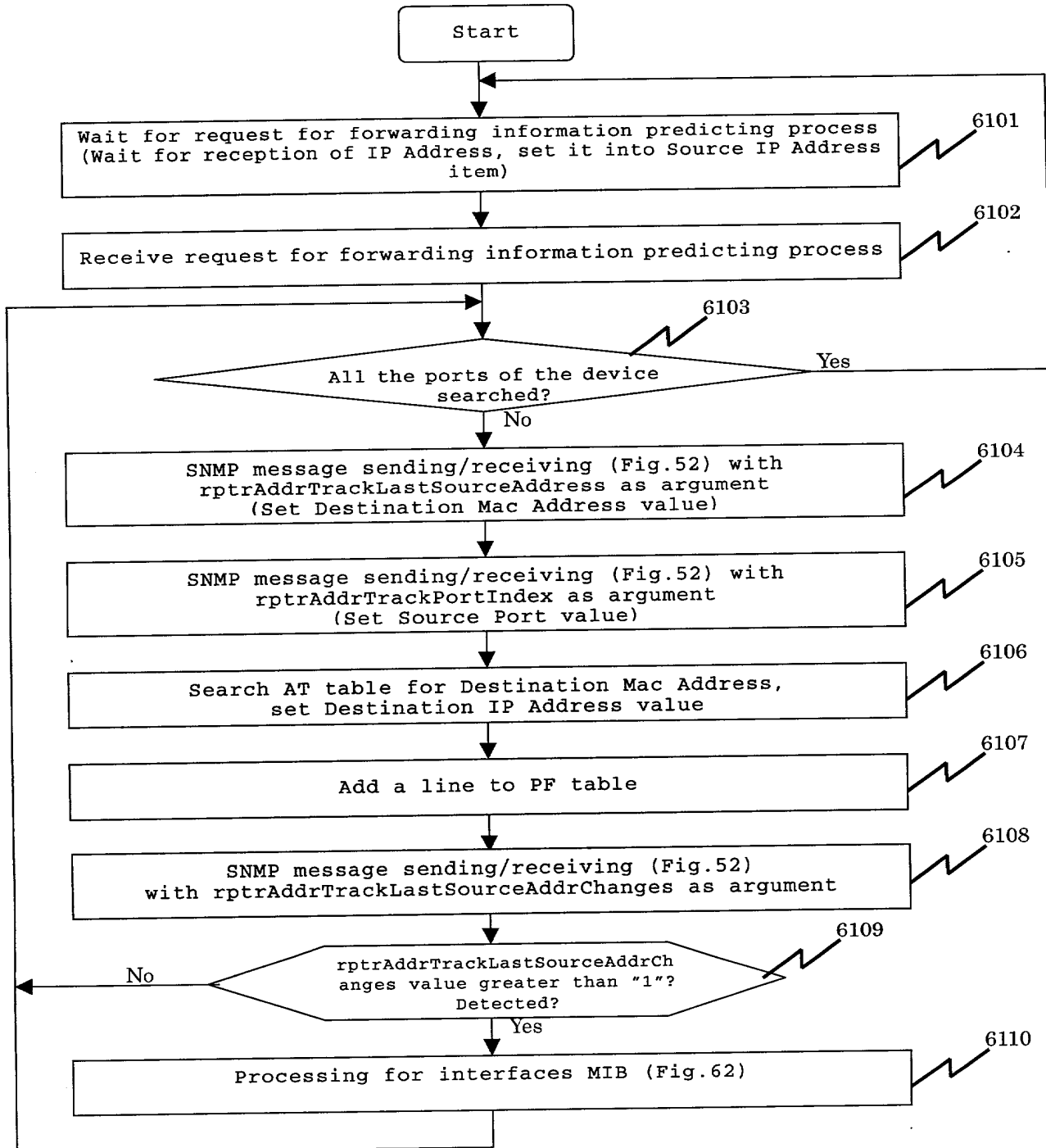


Fig. 62

Operation Flowchart 10 for Auto Discovery Module  
(PF Table Creation (Processing for interfaces MIB))

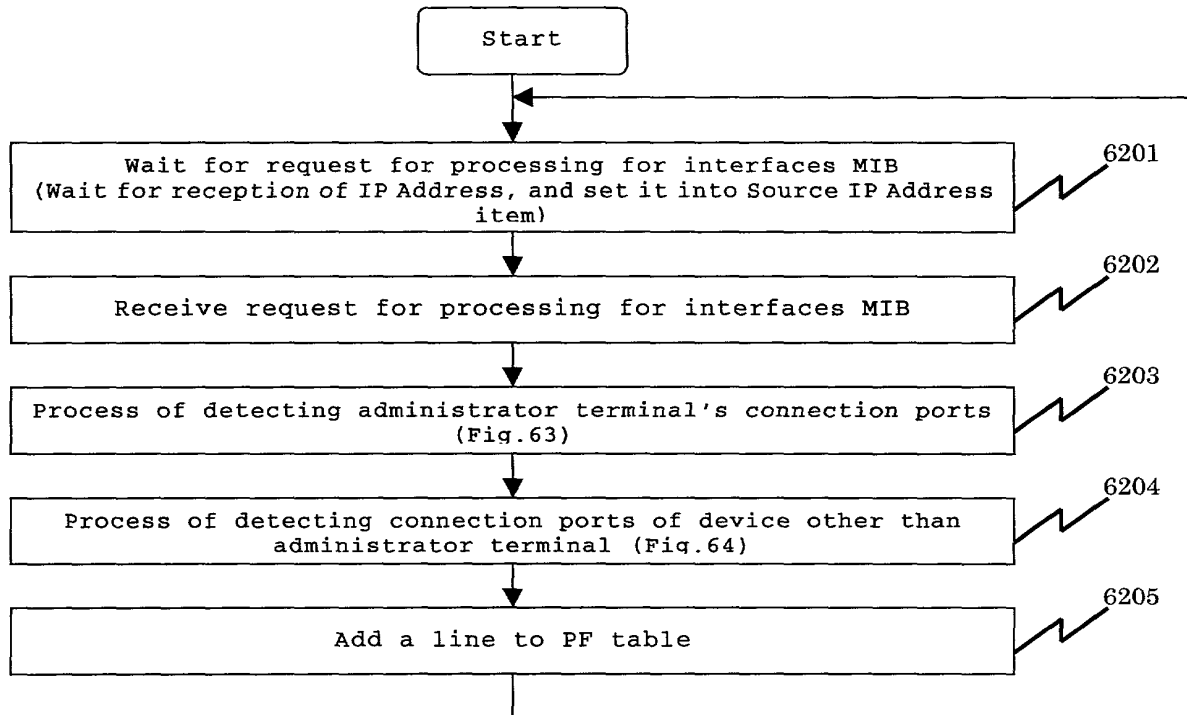
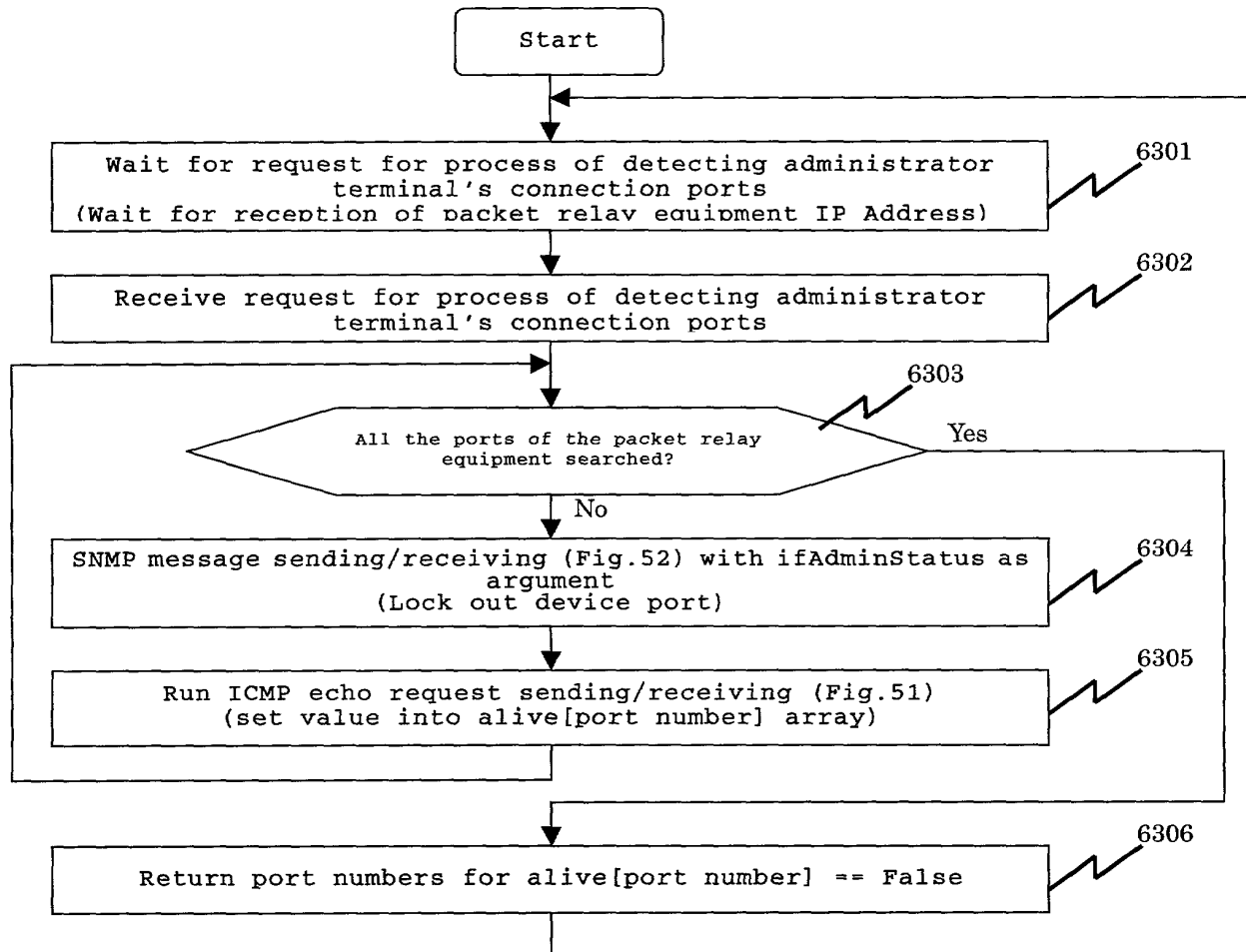


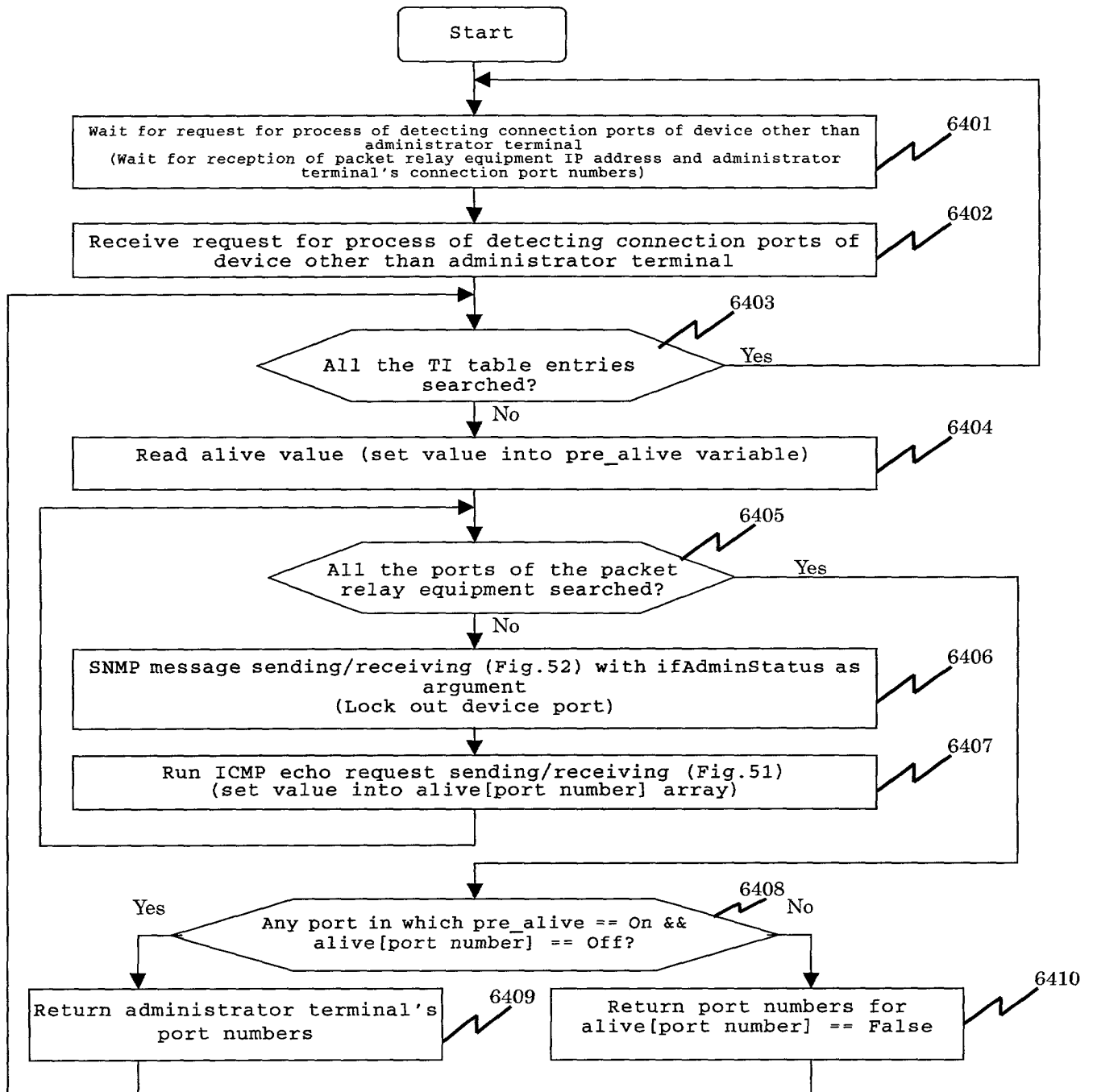
Fig. 63

Operation Flowchart 11 for Auto Discovery Module  
(Processing for interfaces MIB (Process of Detecting Administrator Terminal's  
Connection Ports))



# Fig. 64

Operation Flowchart 12 for Auto Discovery Module  
(Processing for interfaces MIB (Process of Detecting Connection Ports of Device  
Other than Administrator Terminal))



# Fig. 65

Operation Flowchart 13 for Auto Discovery Module  
(Process for TS Table Creation)

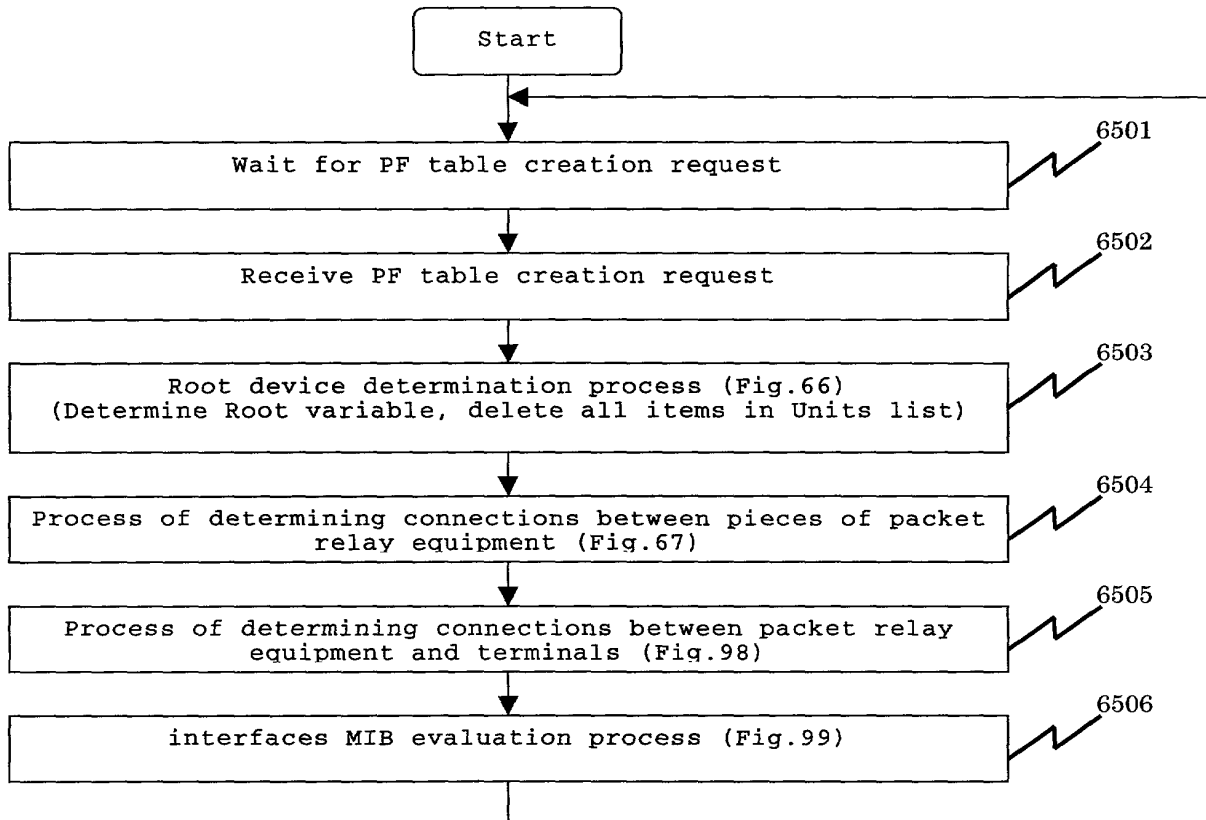


Fig. 66

Operation Flowchart 14 for Auto Discovery Module  
(TS Table Creation (Root Device Determination process))

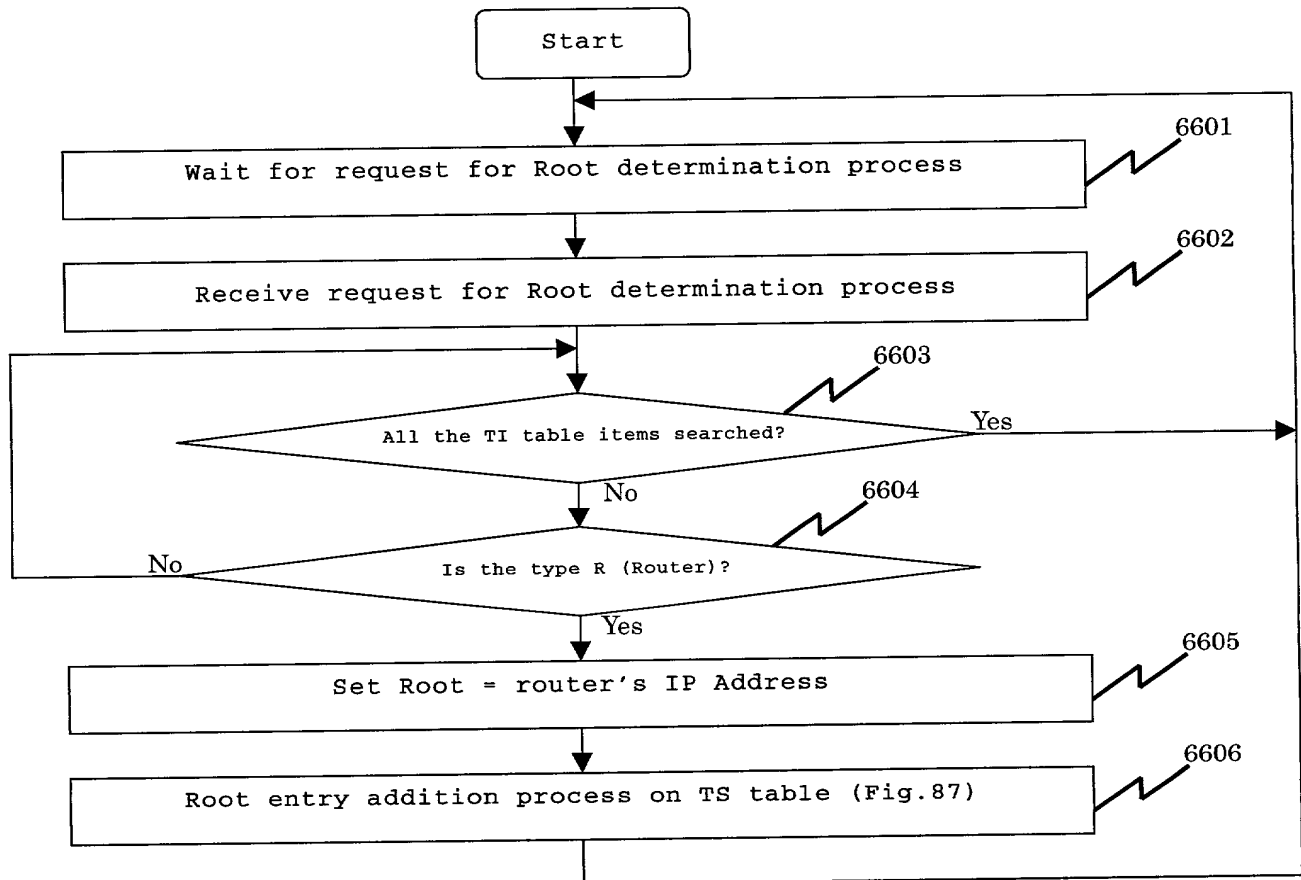
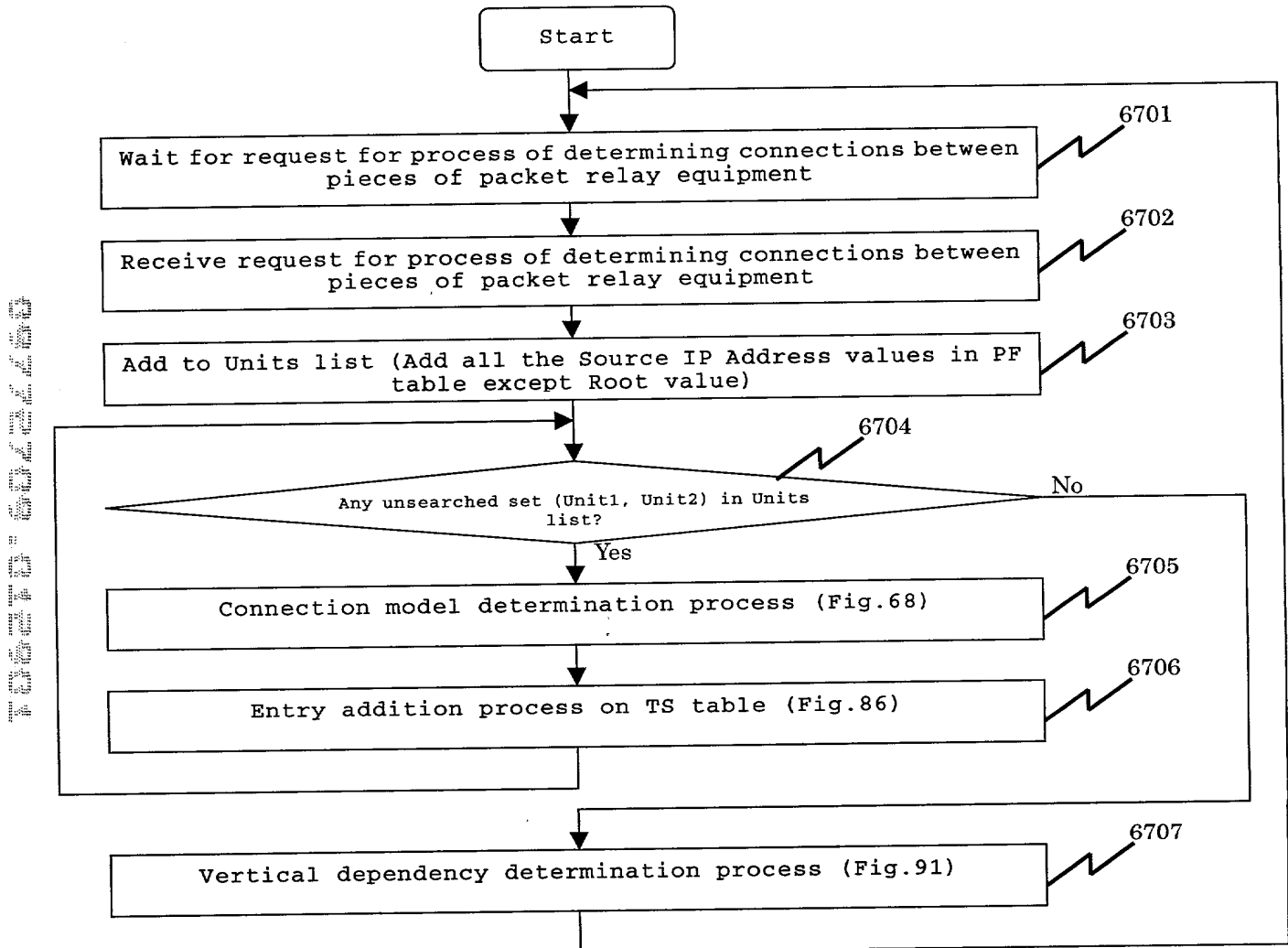


Fig. 67

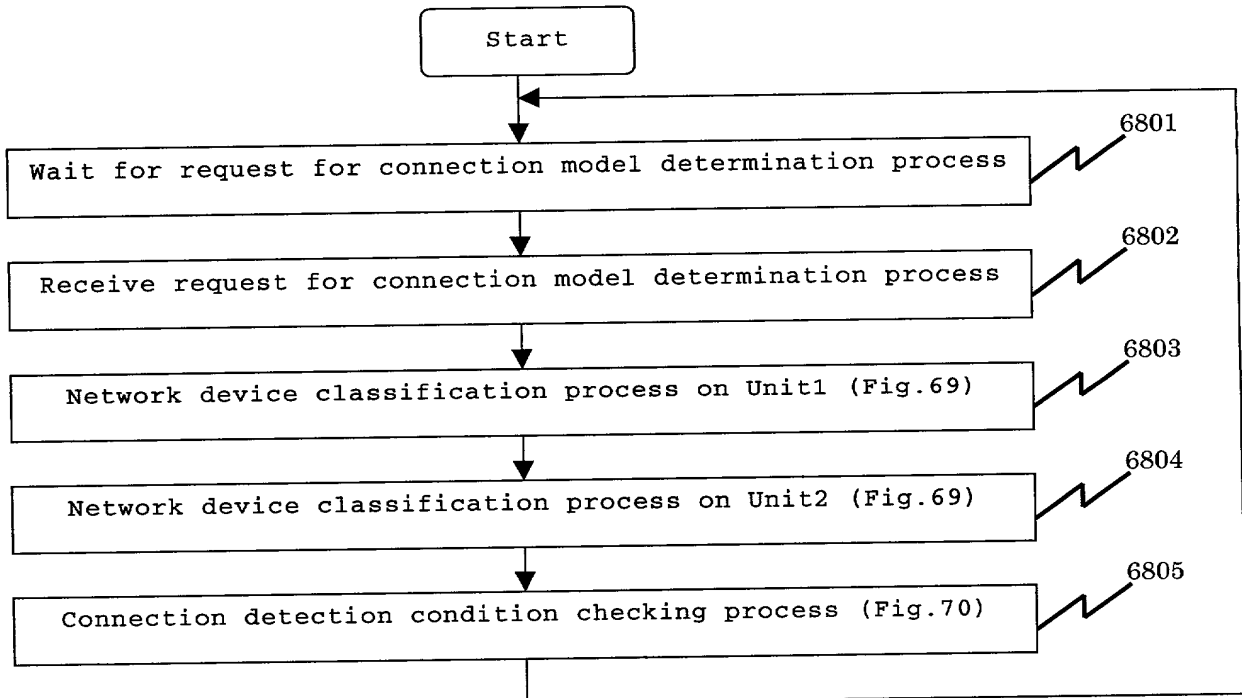
Operation Flowchart 15 for Auto Discovery Module  
(TS Table Creation (Process of Determining Connections between Pieces of Packet Relay Equipment))





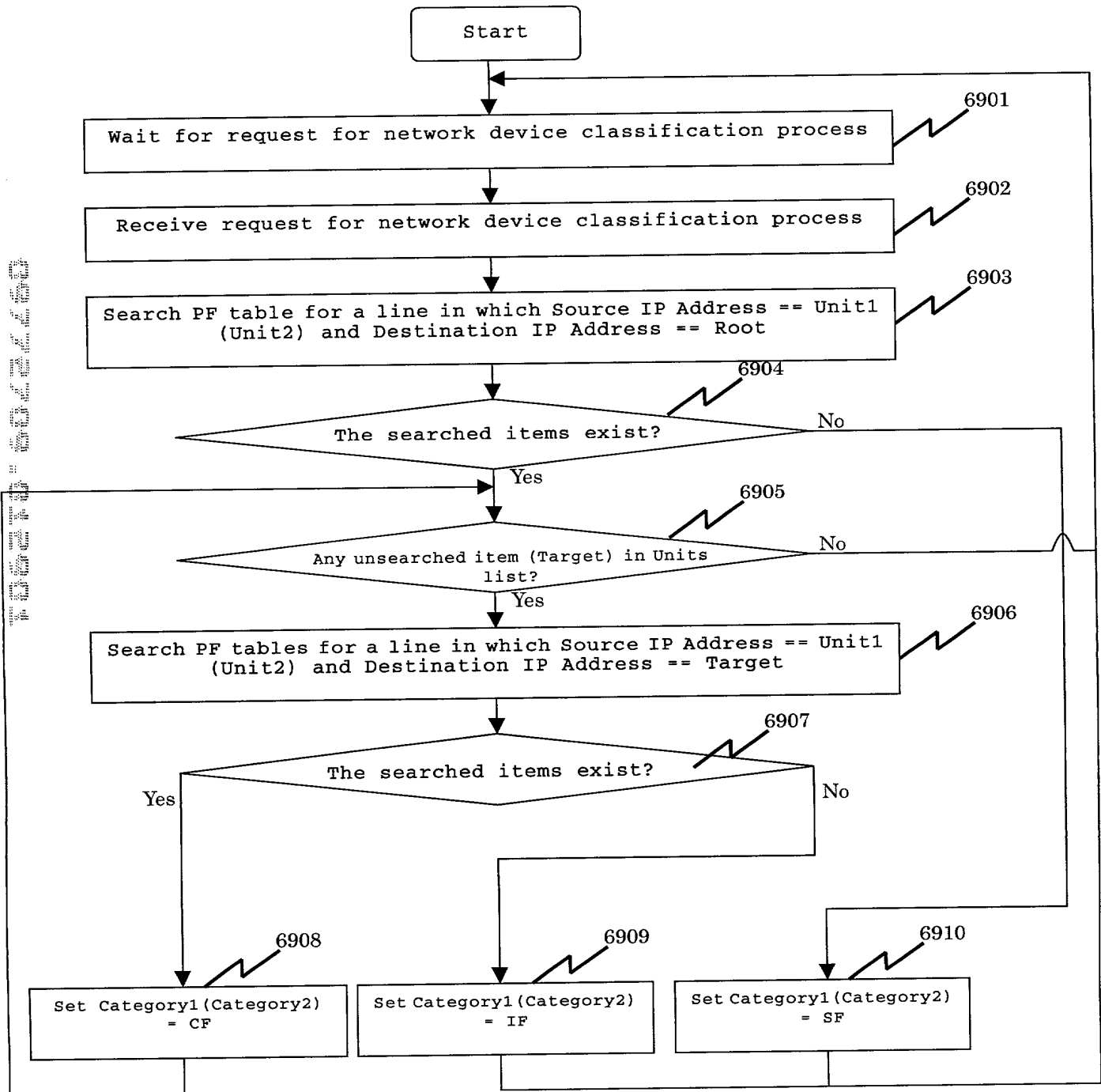
# Fig. 68

Operation Flowchart 16 for Auto Discovery Module  
(TS Table Creation (Connection Model Determination process))



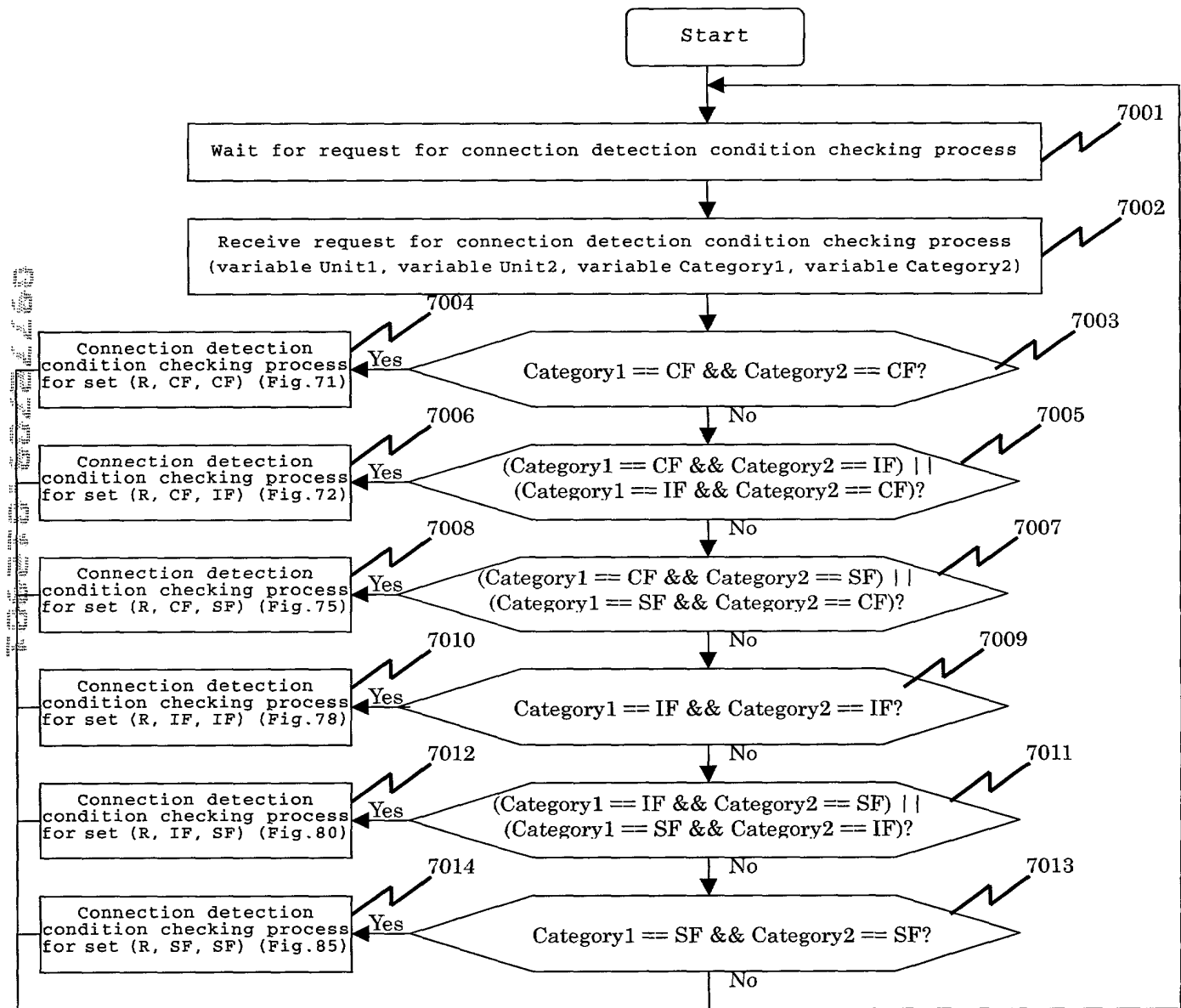
# Fig. 69

Operation Flowchart 17 for Auto Discovery Module  
(TS Table Creation (Network Device Classification Process) (Fig.16))



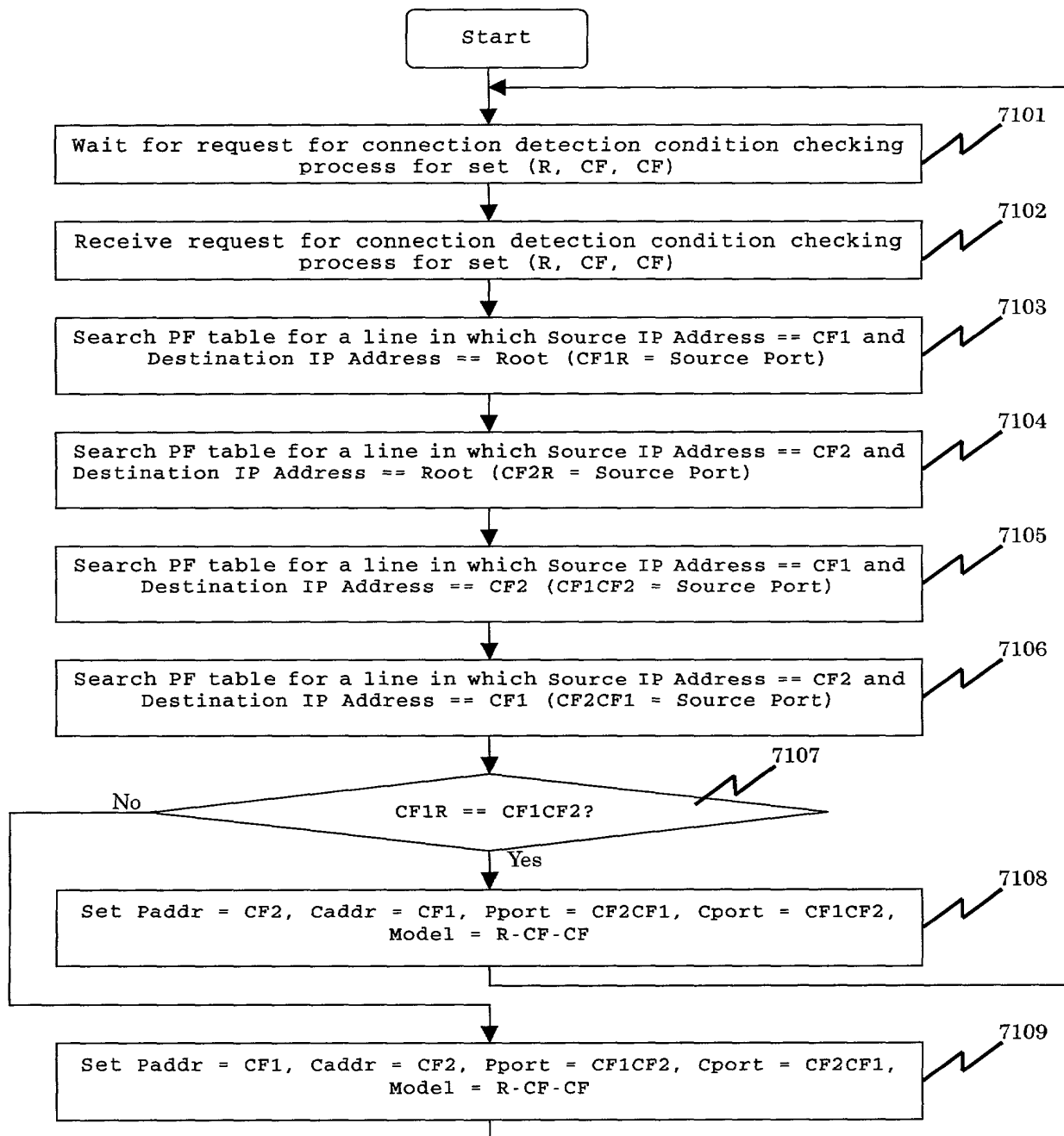
# Fig. 70

Operation Flowchart 18 for Auto Discovery Module  
(TS Table Creation (Connection Detection Condition Checking Process) (Fig.25))



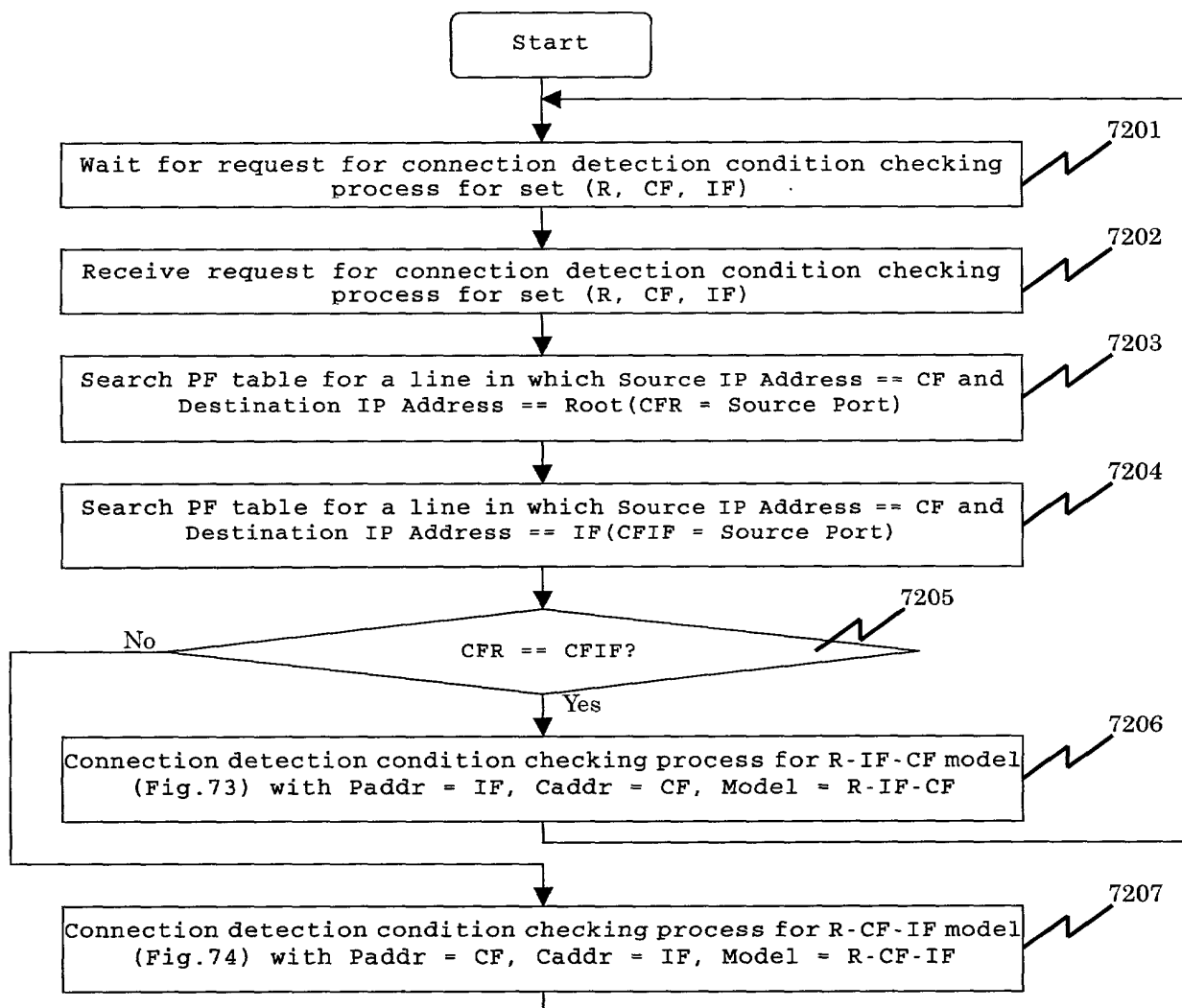
# Fig. 71

Operation Flowchart 19 for Auto Discovery Module  
(TS Table Creation (Connection Detection Condition Checking Process for Set (R, CF, CF)) (Fig.25))



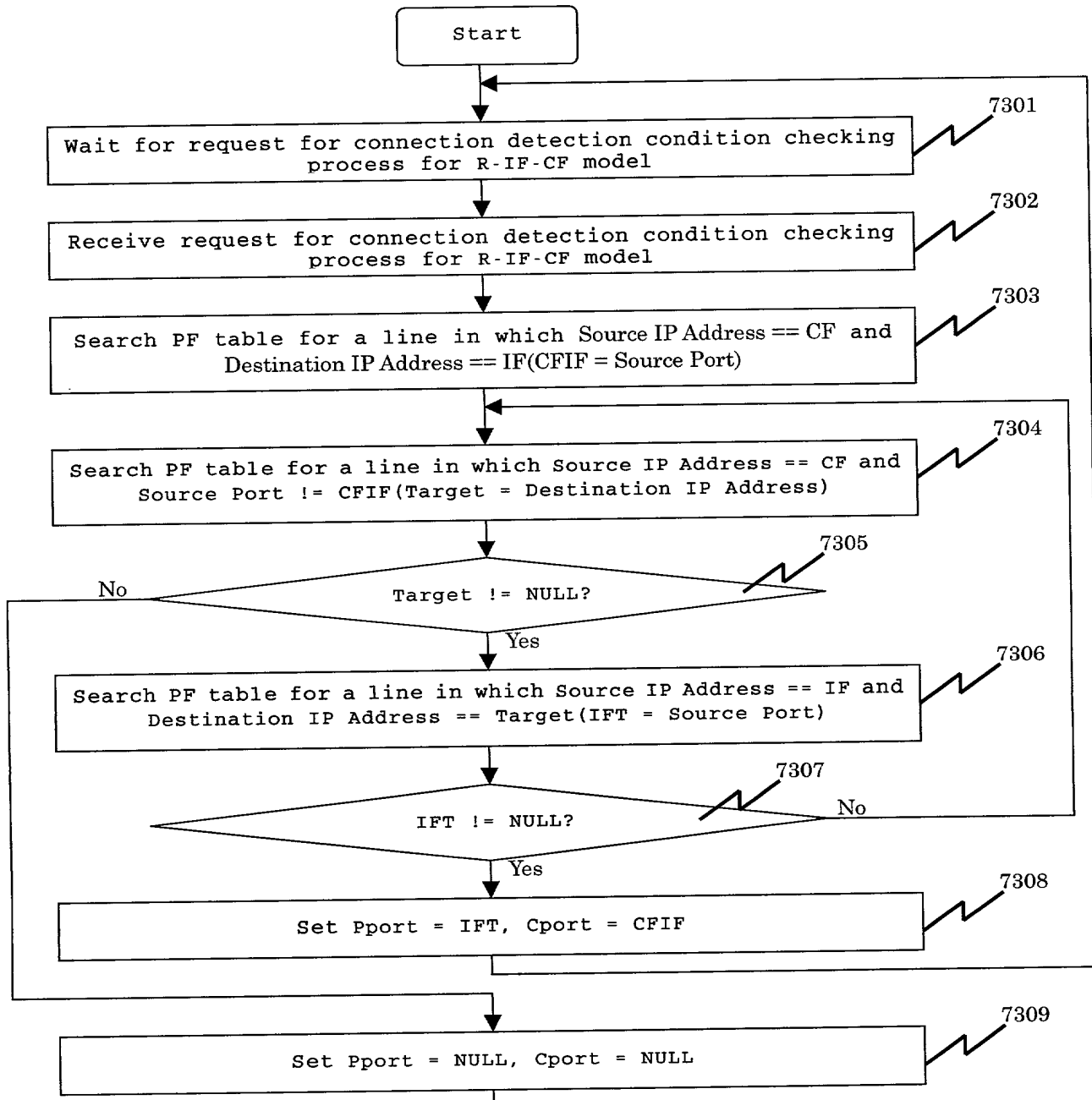
# Fig. 72

Operation Flowchart 20 for Auto Discovery Module  
(TS Table Creation(Connection Detection Condition Checking Process for Set (R, CF, IF)) (Fig.25))



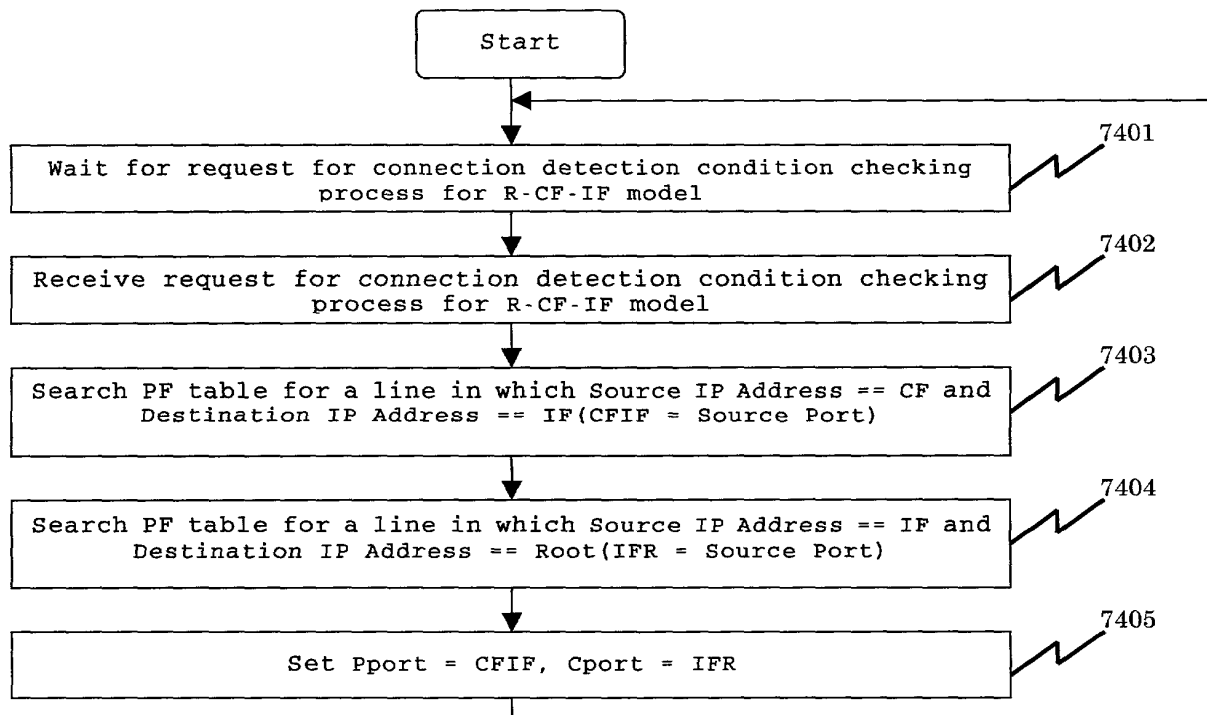
# Fig. 73

Operation Flowchart 21 for Auto Discovery Module  
(TS Table Creation(Connection Detection Condition Checking Process for R-IF-CF Model) (Fig.25))



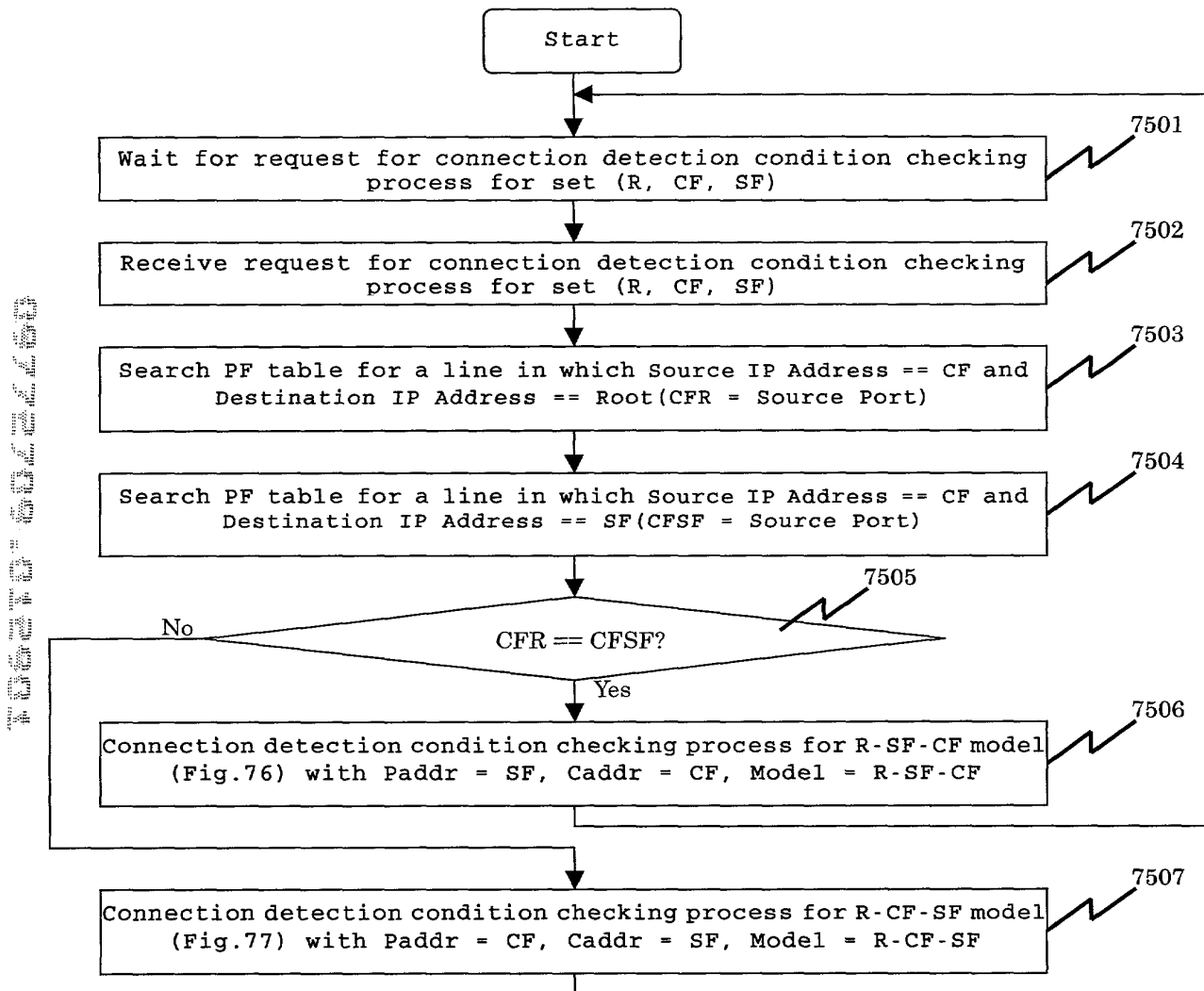
# Fig. 74

Operation Flowchart 22 for Auto Discovery Module  
(TS Table Creation(Connection Detection Condition Checking Process for  
R-CF-IF Model) (Fig.25))



# Fig. 75

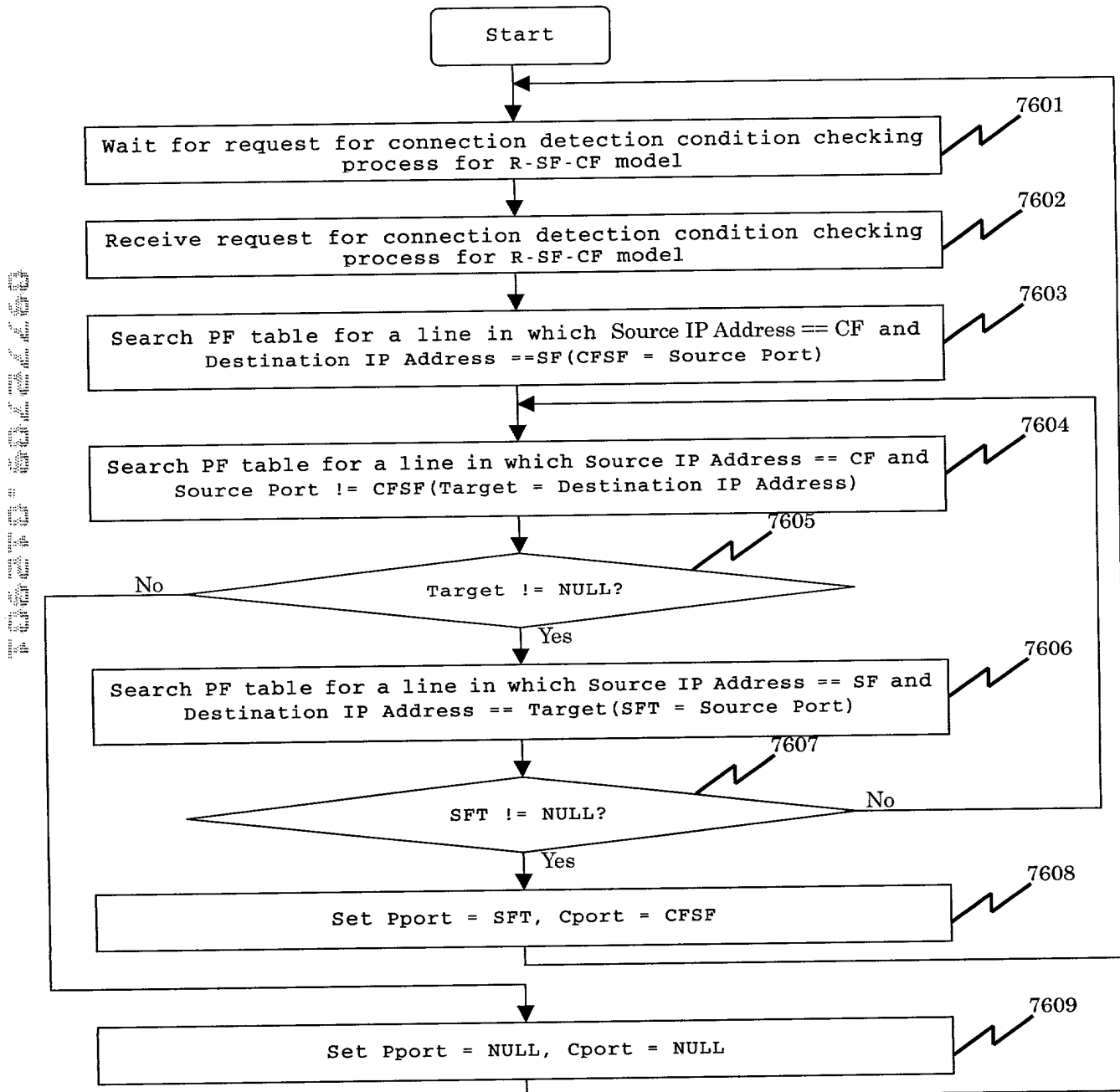
Operation Flowchart 23 for Auto Discovery Module  
(TS Table Creation(Connection Detection Condition Checking Process for Set (R, CF, SF)) (Fig.25))





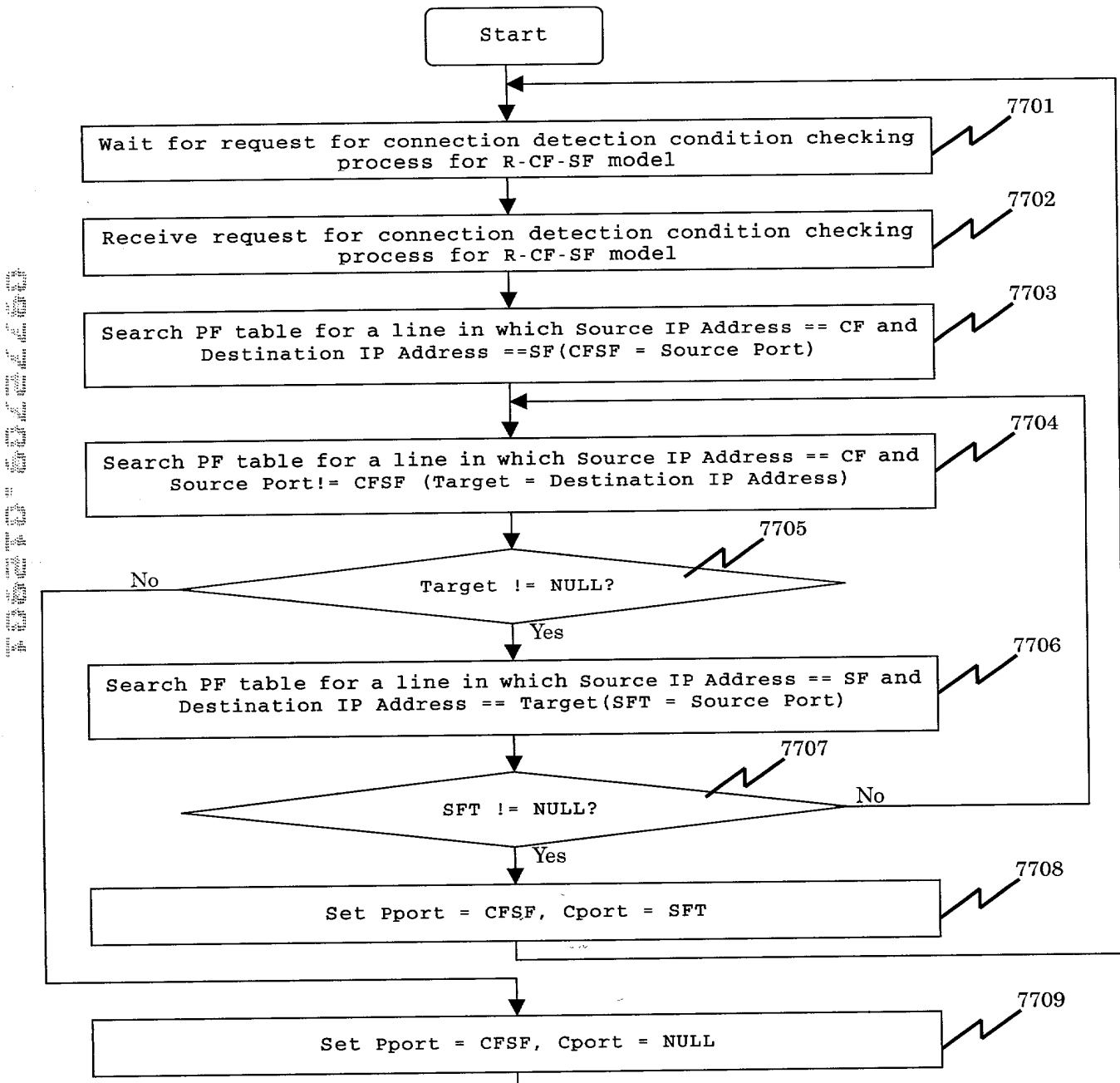
# Fig. 76

Operation Flowchart 24 for Auto Discovery Module  
(TS Table Creation(Connection Detection Condition Checking Process for R-SF-CF Model) (Fig.25))



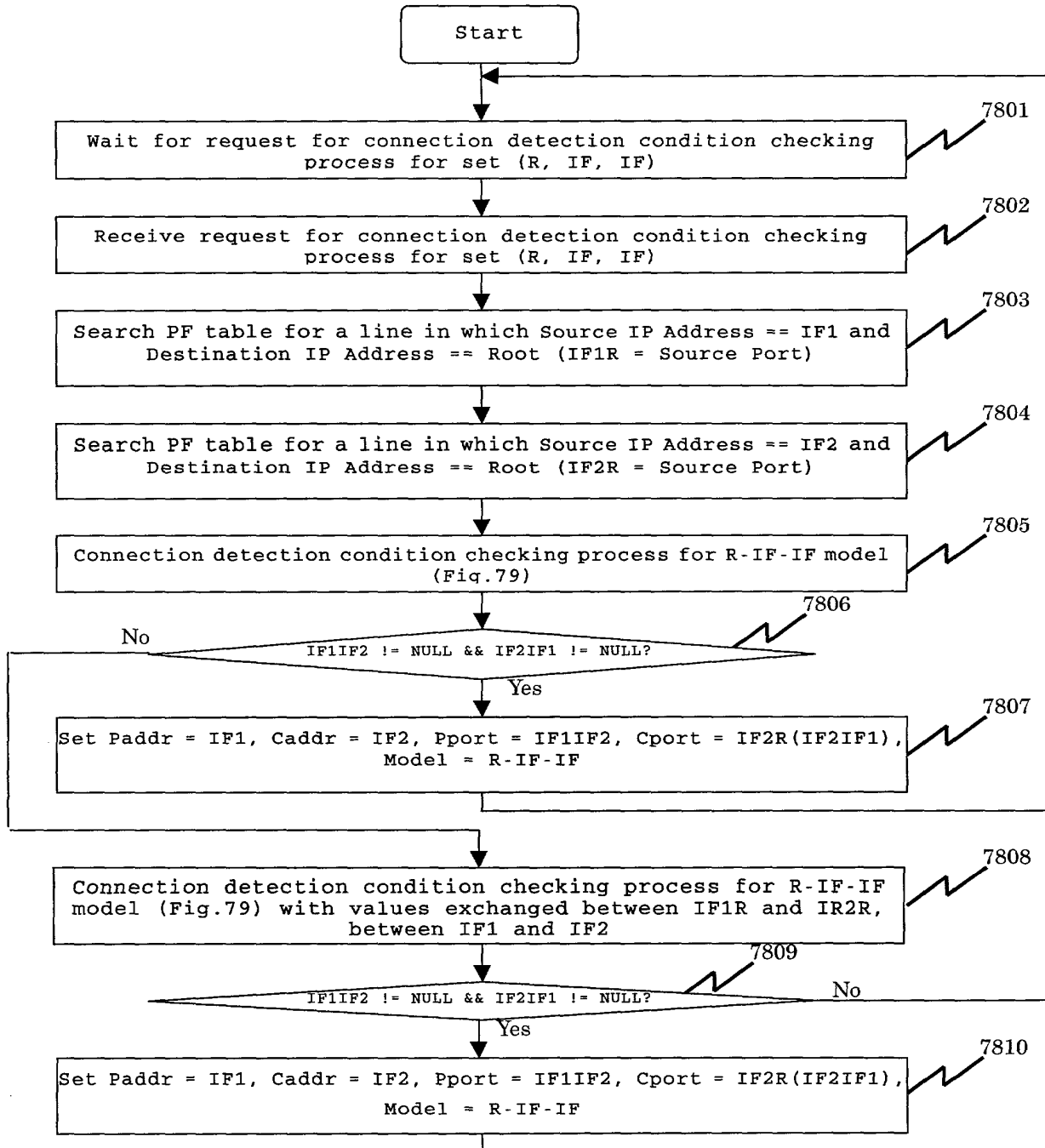
# Fig. 77

Operation Flowchart 25 for Auto Discovery Module  
(TS Table Creation(Connection Detection Condition Checking Process for R CF  
-SF- Model) (Fig.25))



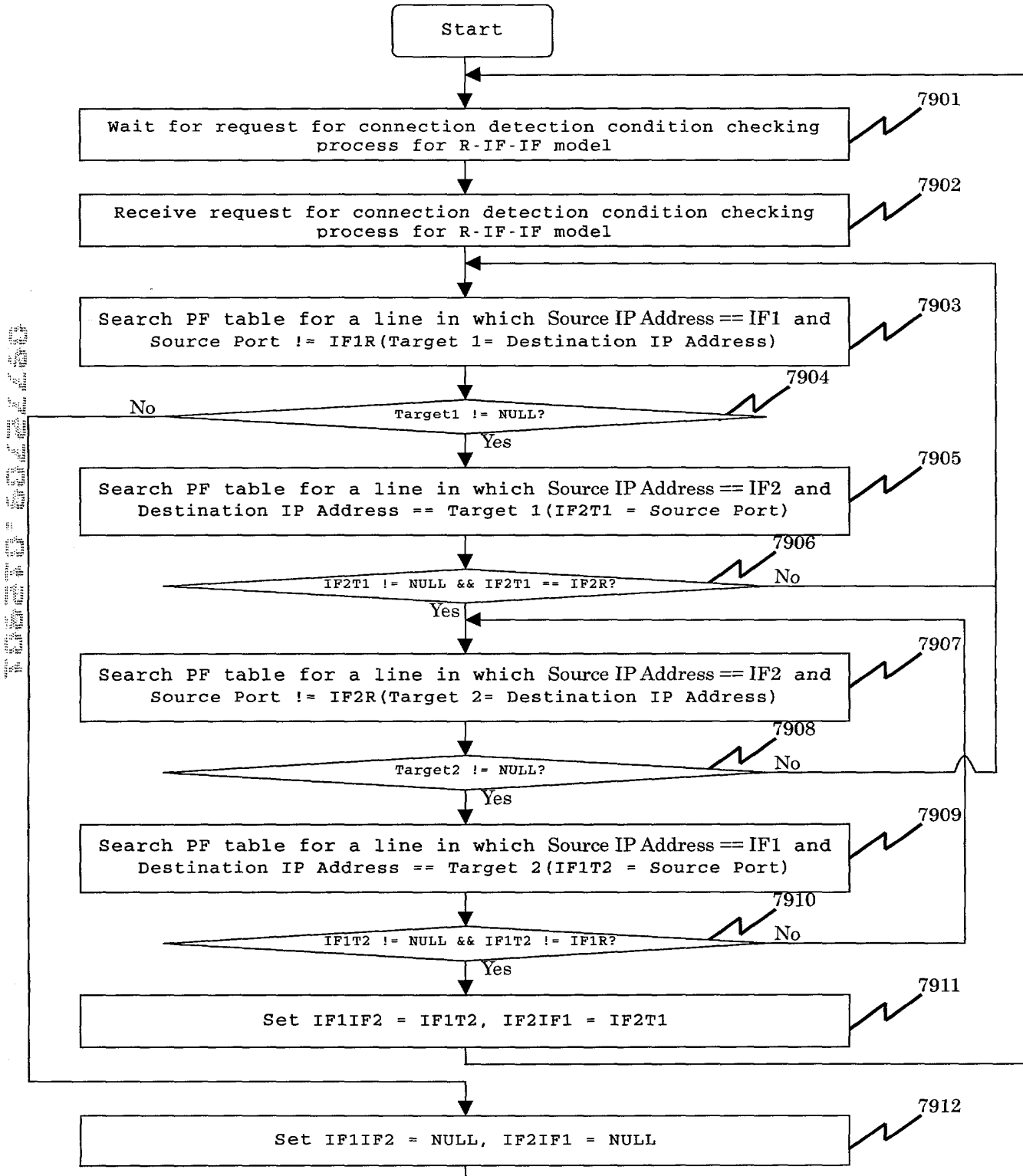
# Fig. 78

Operation Flowchart 26 for Auto Discovery Module  
(TS Table Creation (Connection Detection Condition Checking Process for Set (R, IF, IF)) (Fig.25))



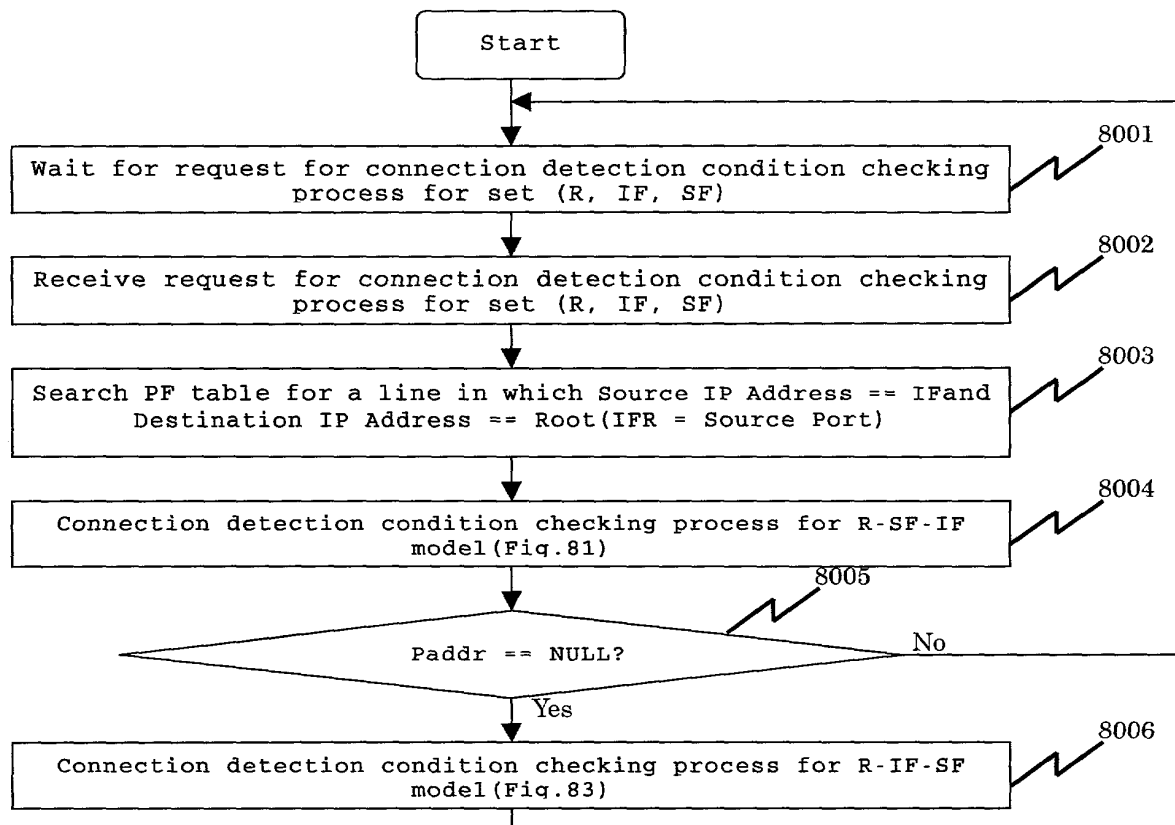
# Fig. 79

Operation Flowchart 27 for Auto Discovery Module  
(TS Table Creation(Connection Detection Condition Checking Process for R-IF-IF Model) (Fig.25))



# Fig. 80

Operation Flowchart 28 for Auto Discovery Module  
(TS Table Creation(Connection Detection Condition Checking Process for Set (R, IF, SF)) (Fig.25))



# Fig. 81

Operation Flowchart 29 for Auto Discovery Module  
(TS Table Creation(Connection Detection Condition Checking Process for R-SF-IF Model) (Fig.25))

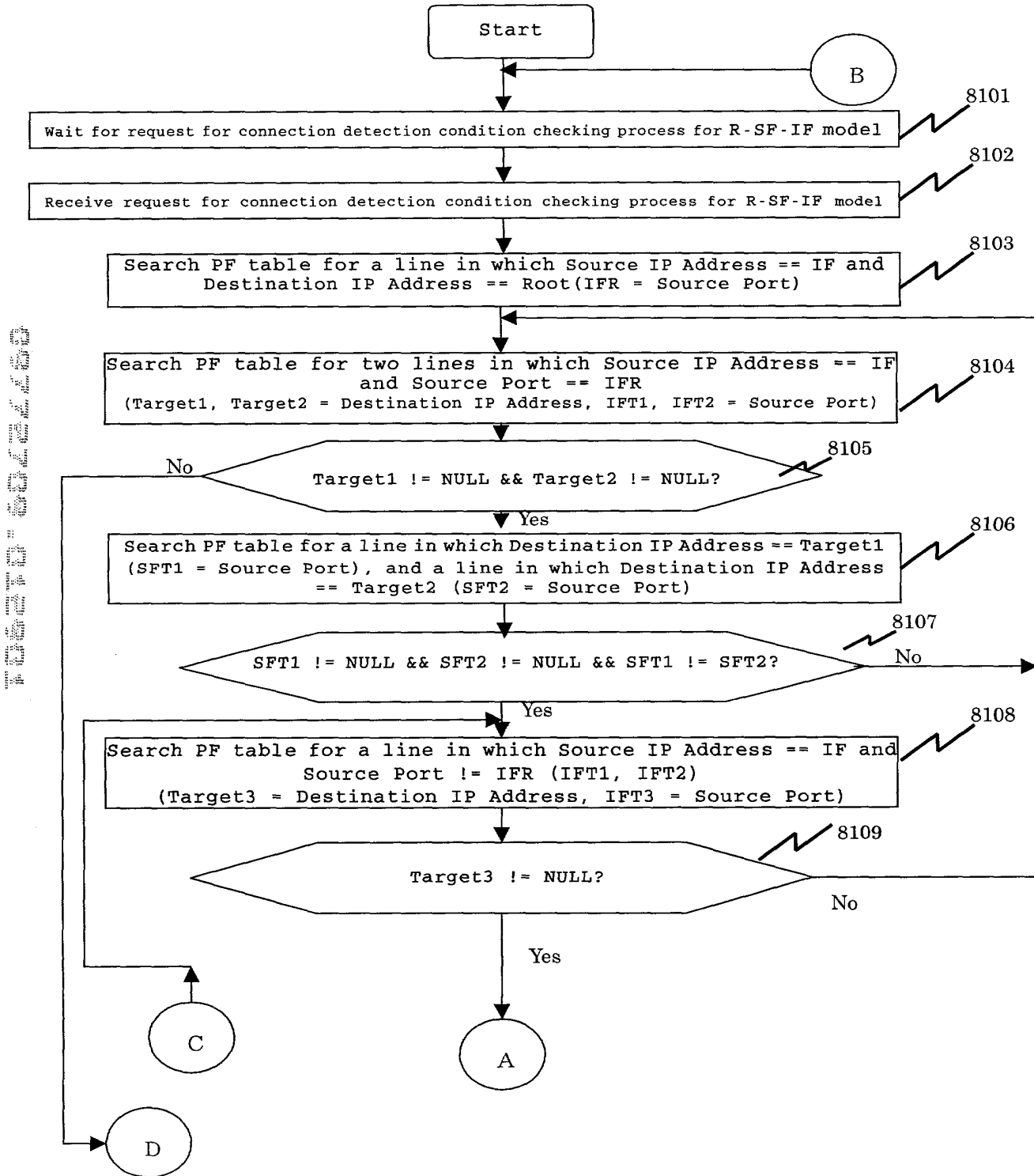
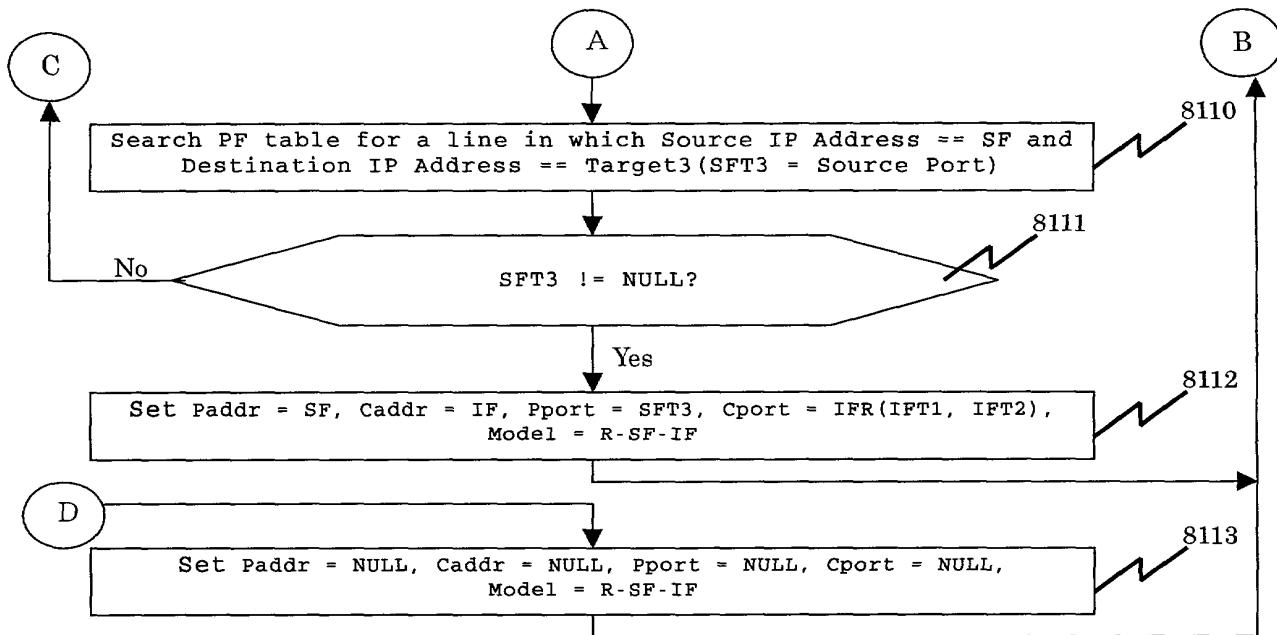


Fig. 82



# Fig. 83

Operation Flowchart 30 for Auto Discovery Module  
(TS Table Creation(Connection Detection Condition Checking Process for R-IF-SF Model) (Fig.25))

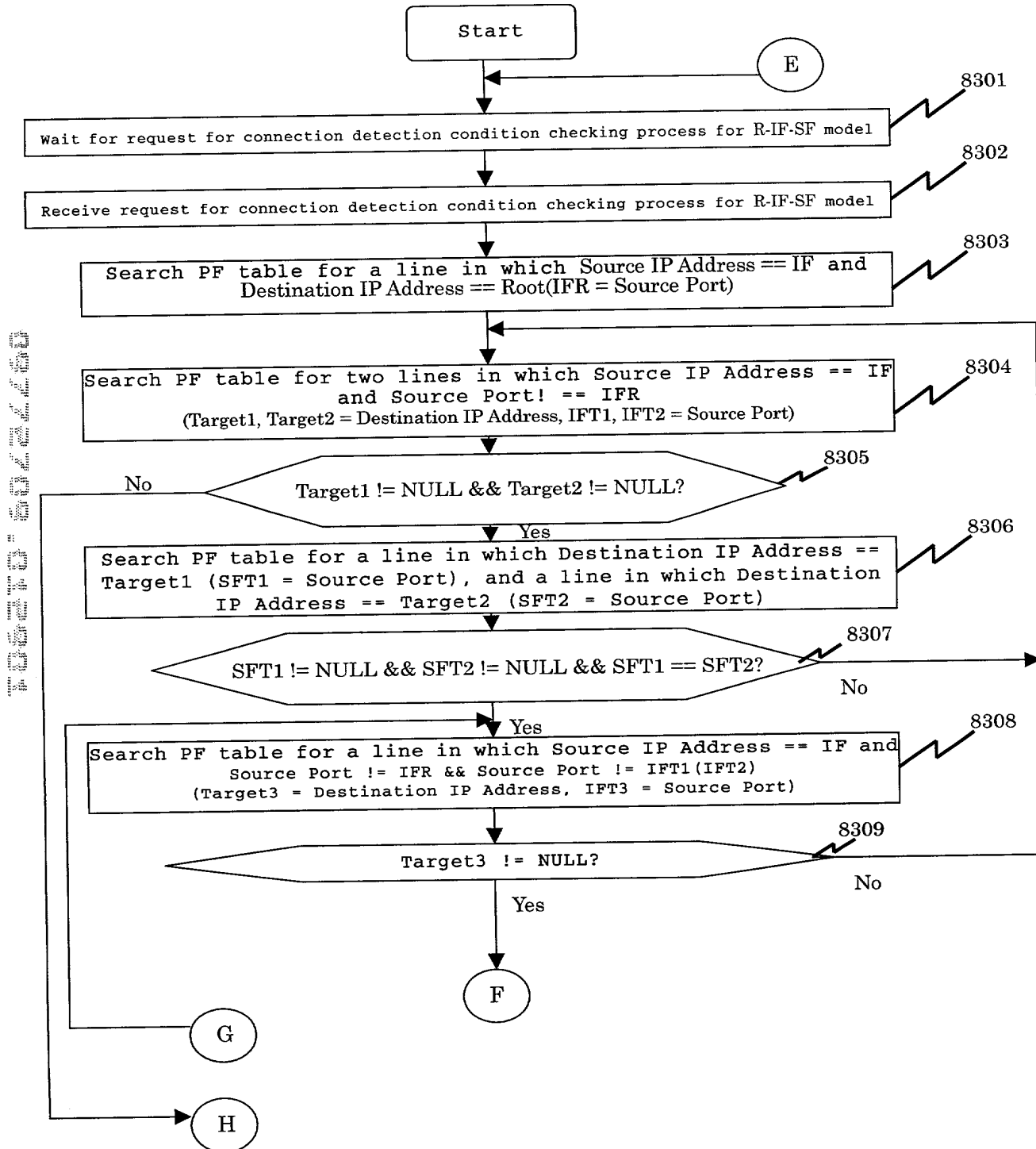
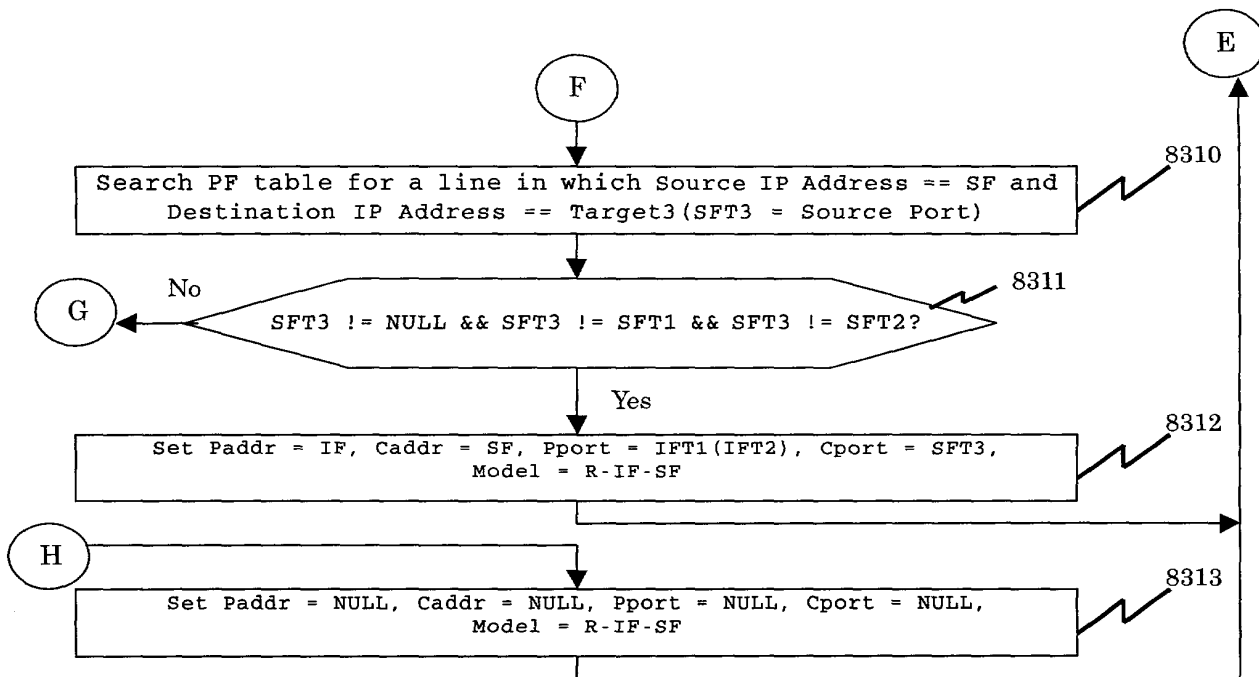


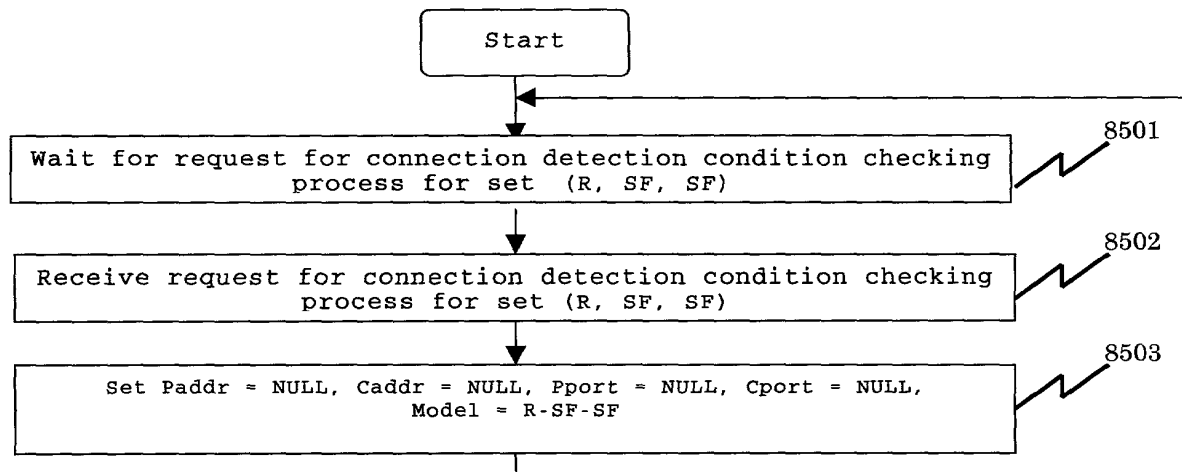


Fig. 84



# Fig. 85

Operation Flowchart 31 for Auto Discovery Module  
(TS Table Creation(Connection Detection Condition Checking Process for Set (R,  
SF, SF)) (Fig.25))



# Fig. 86

Operation Flowchart 32 for Auto Discovery Module  
(TS Table Creation (Entry Addition Process on TS Table))

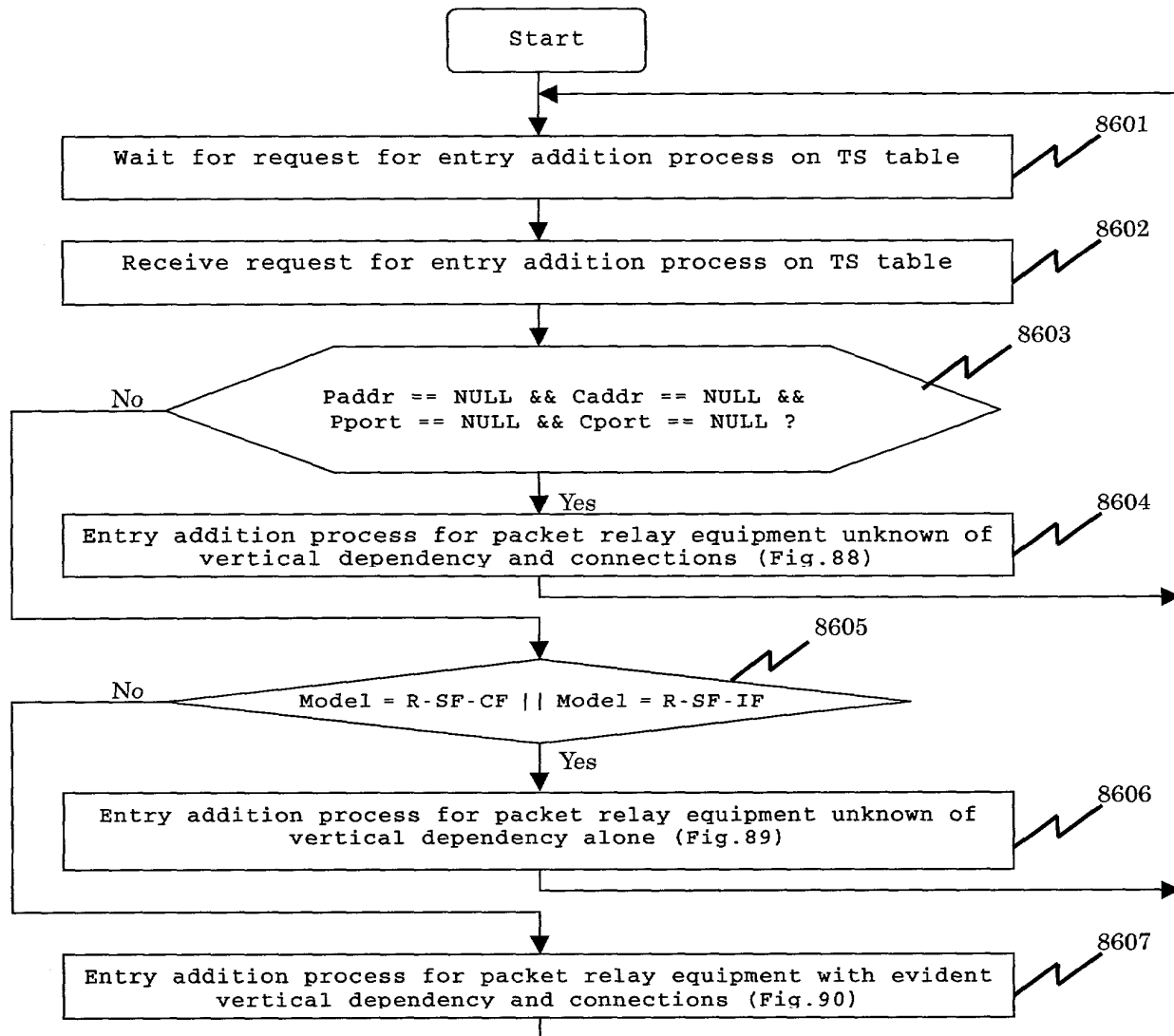


Fig. 87

Operation Flowchart 33 for Auto Discovery Module  
(TS Table Creation (Root Entry Addition process on TS Table))

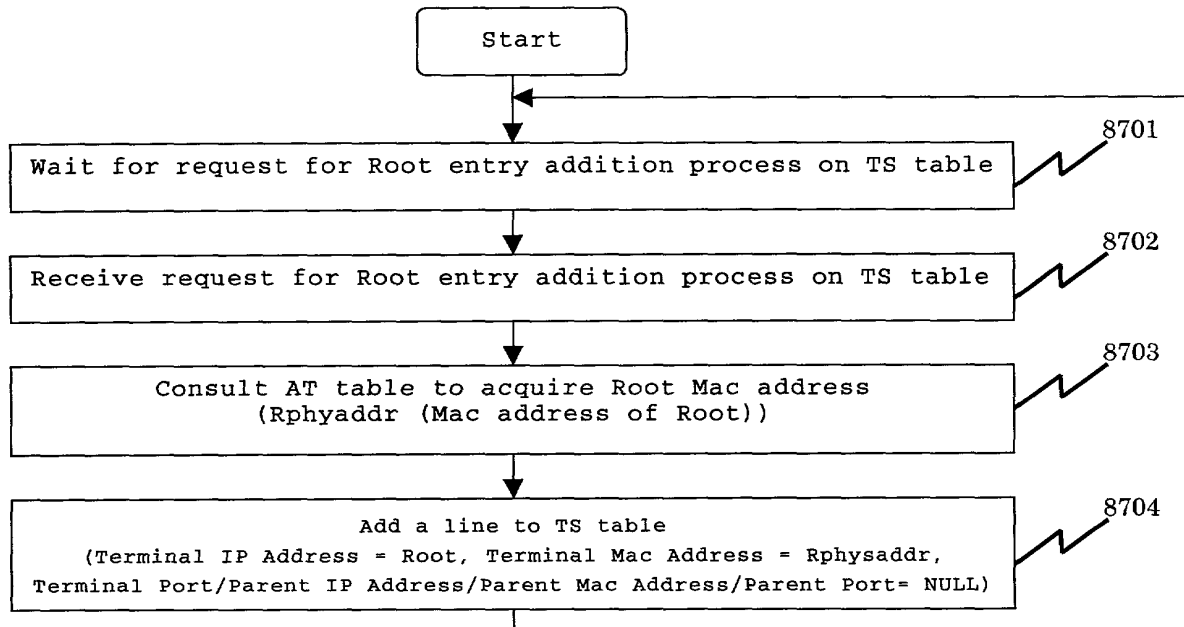
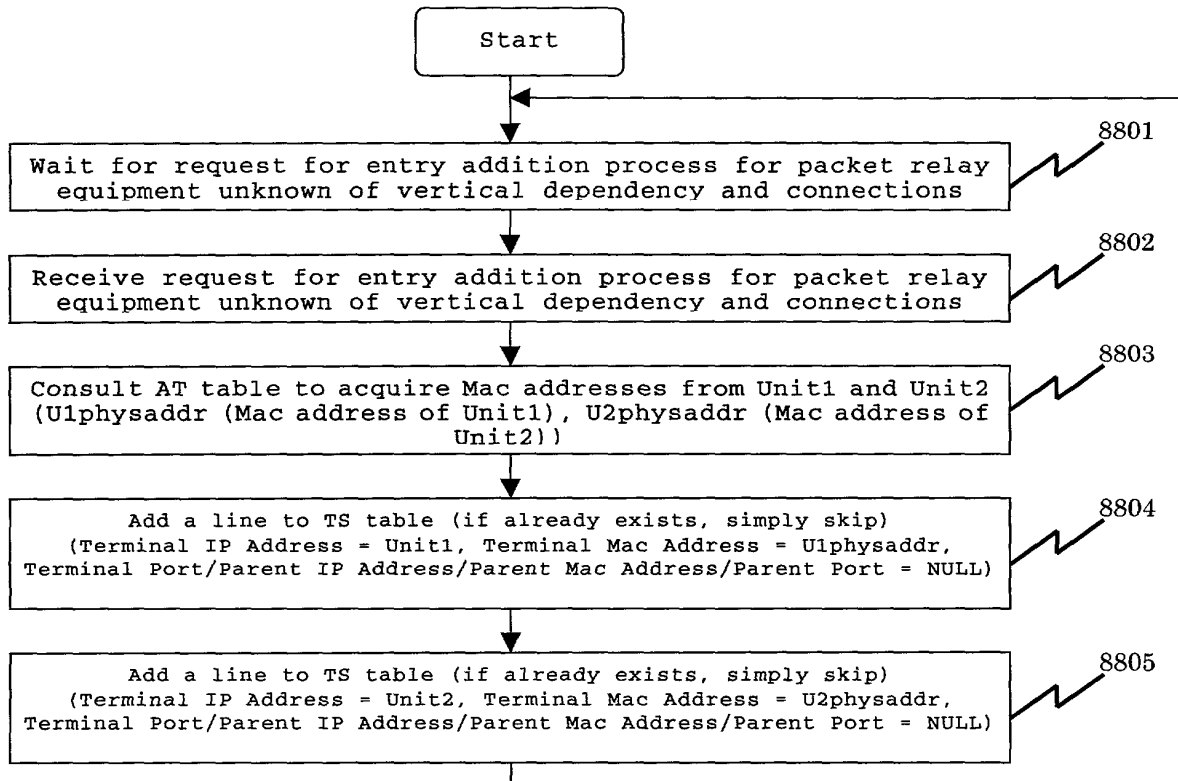


Fig. 88

Operation Flowchart 34 for Auto Discovery Module TS Table Creation  
(TS Table Creation (Entry Addition process for Packet Relay Equipment Unknown of Vertical Dependency And Connections))



# Fig. 89

Operation Flowchart 35 for Auto Discovery Module TS Table Creation  
(TS Table Creation (Entry Addition process for Packet Relay Equipment Unknown of Vertical Dependency Alone))

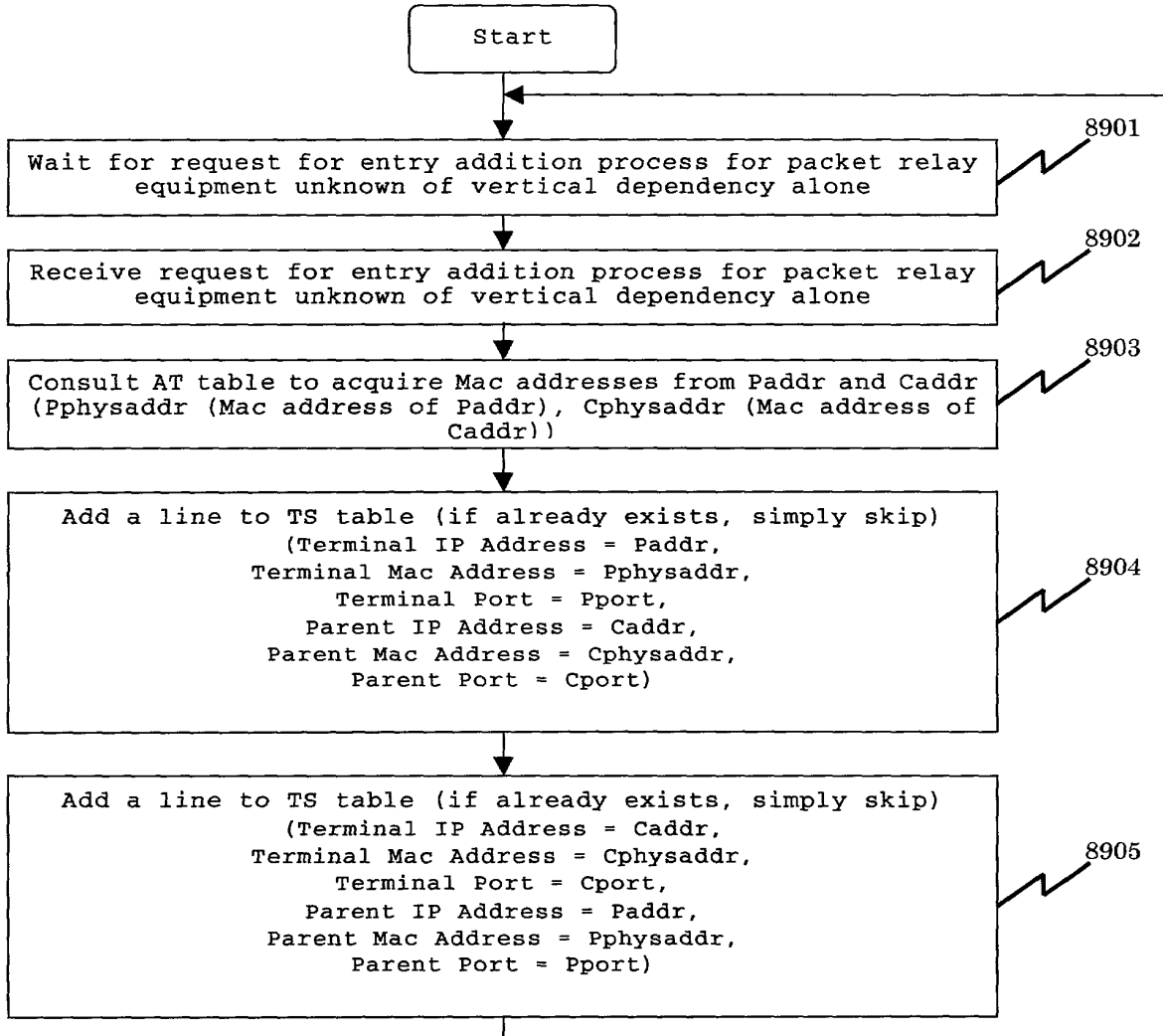


Fig.90

Operation Flowchart 36 for Auto Discovery Module TS Table Creation  
(TS Table Creation (Entry Addition process for Packet Relay Equipment with Evident Vertical Dependency And Connections))

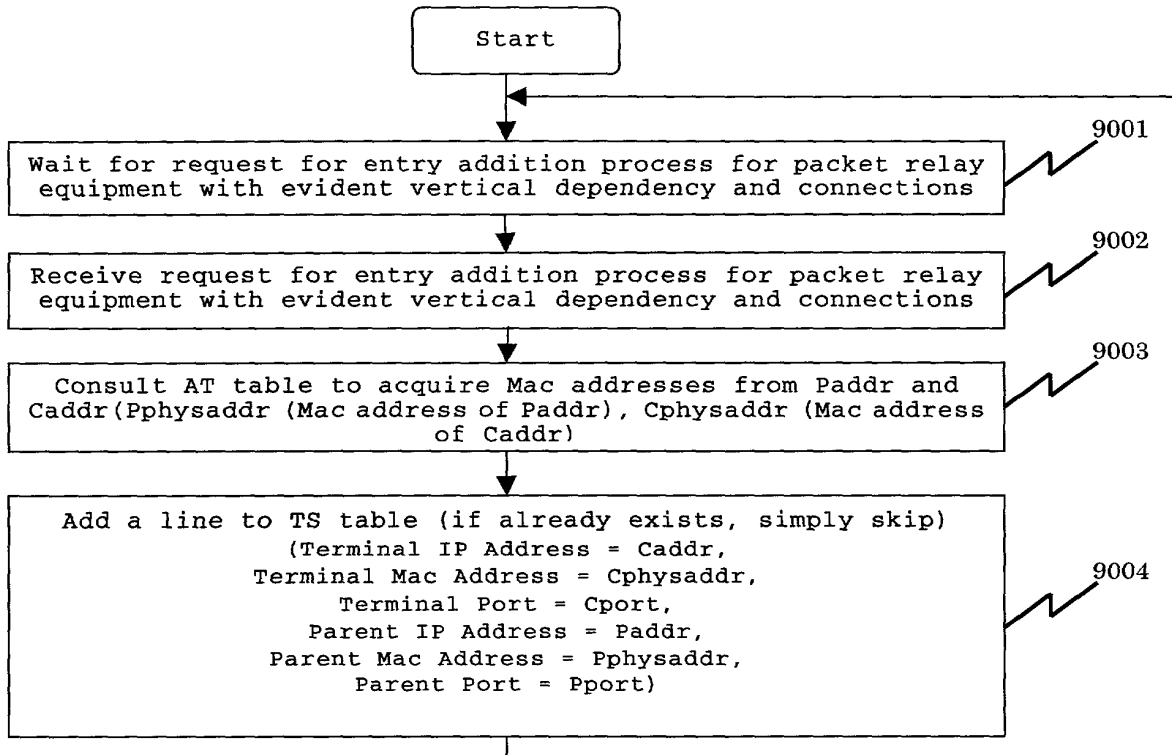


Fig. 91

Operation Flowchart 37 for Auto Discovery Module TS Table Creation  
TS Table Creation (Vertical Dependency Determination process)

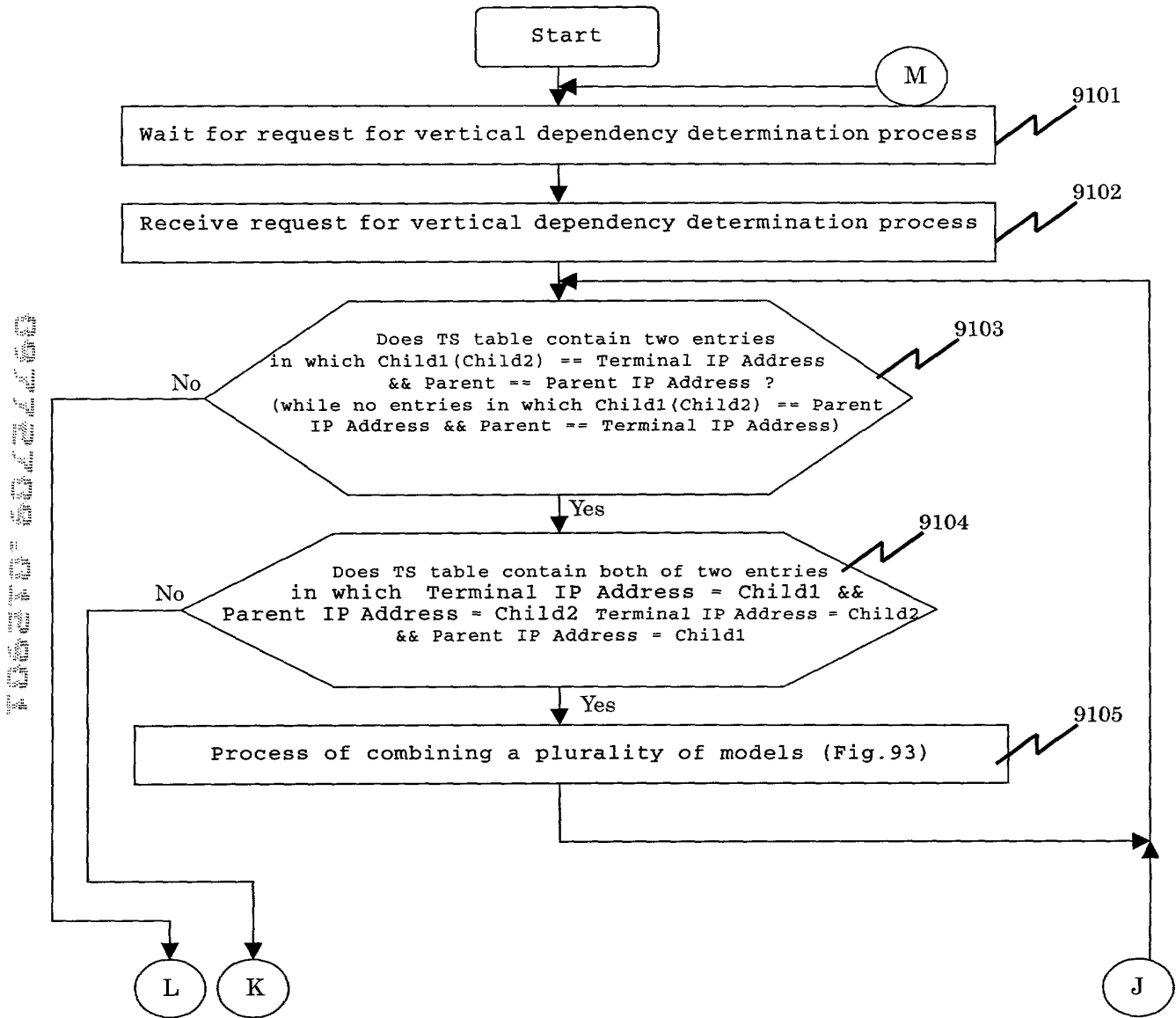




Fig. 92

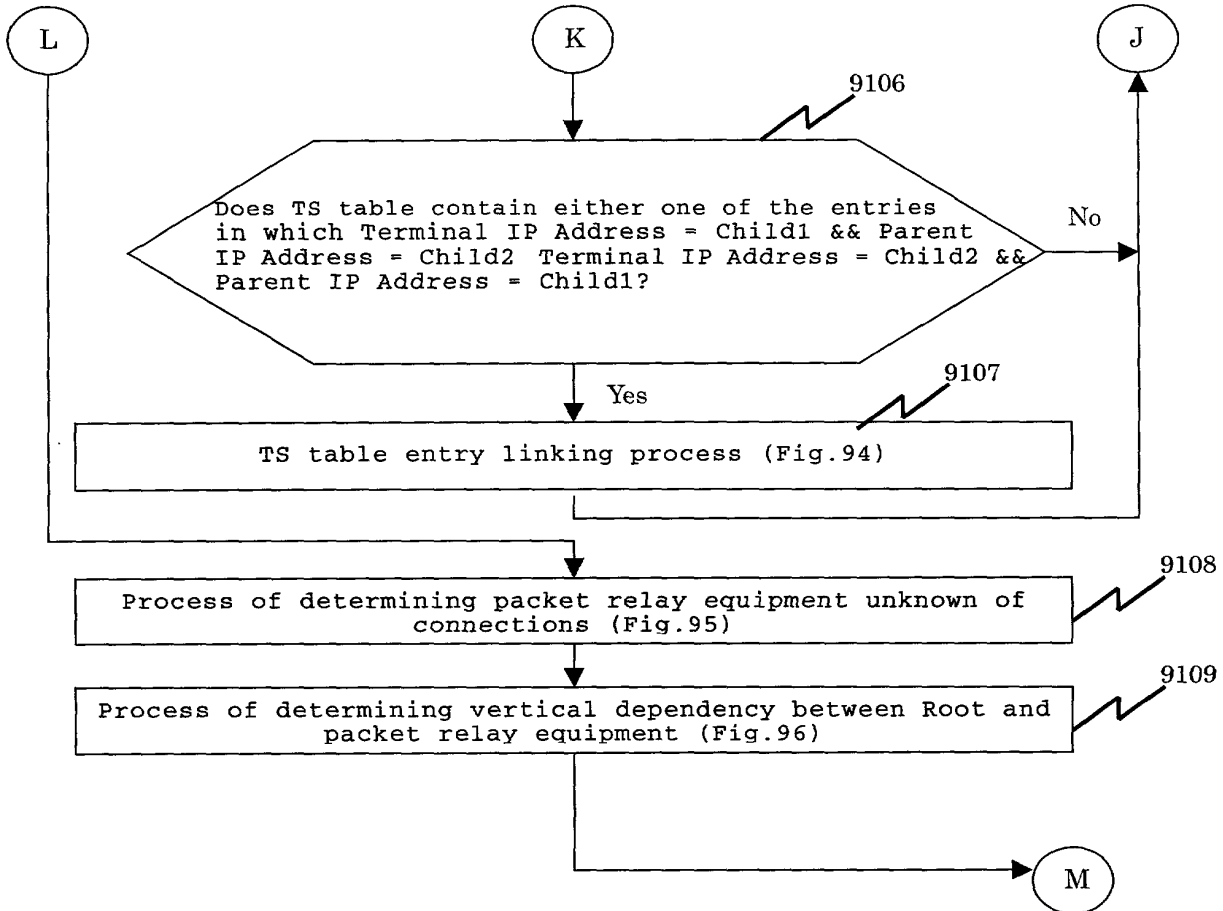


Fig. 93

Operation Flowchart 38 for Auto Discovery Module TS Table Creation  
(TS Table Creation (Process of Combining Plurality of Models (Fig.30))

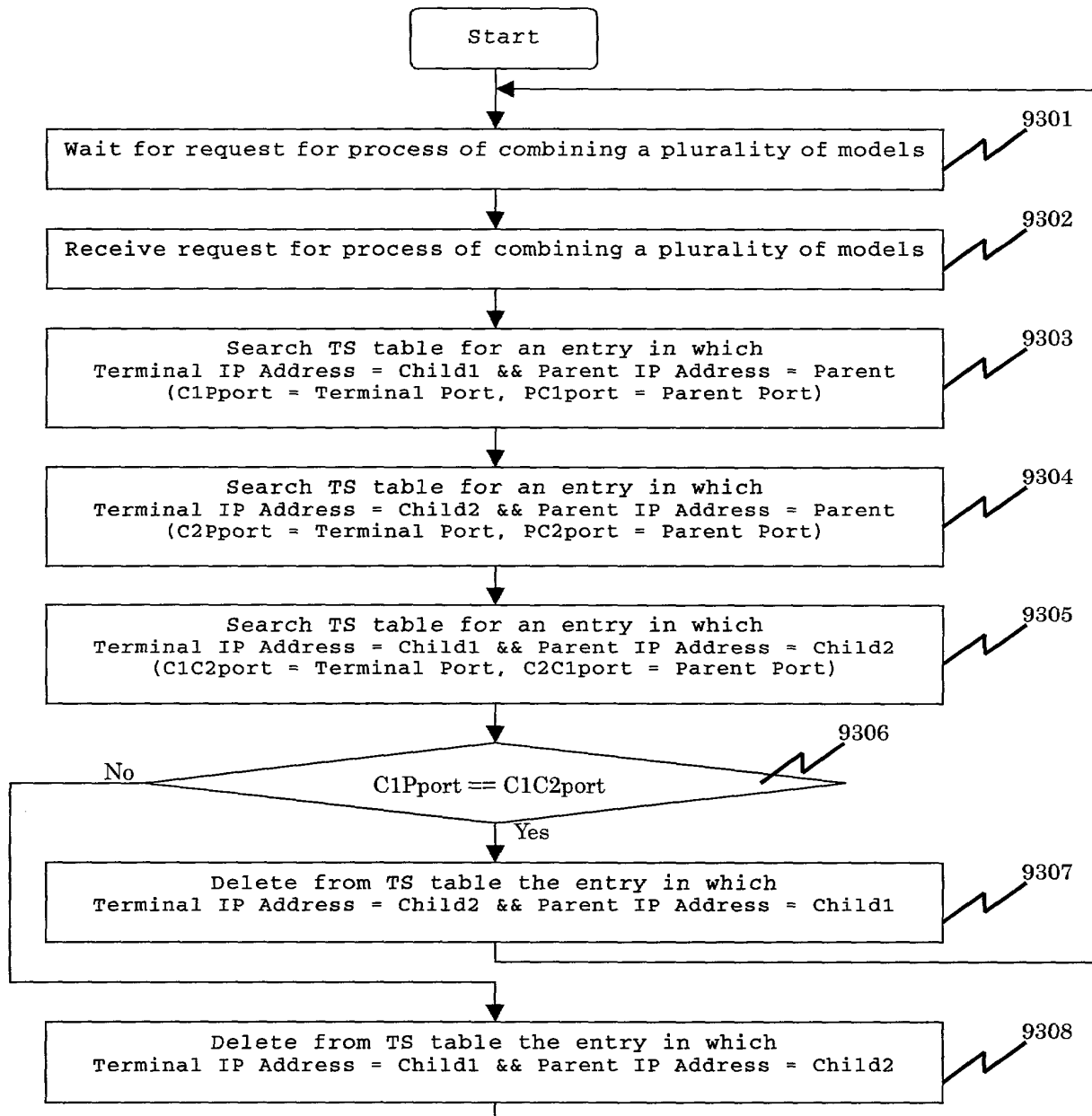


Fig. 94

Operation Flowchart 39 for Auto Discovery Module TS Table Creation  
TS Table Creation (TS Table Entry Linking Process)

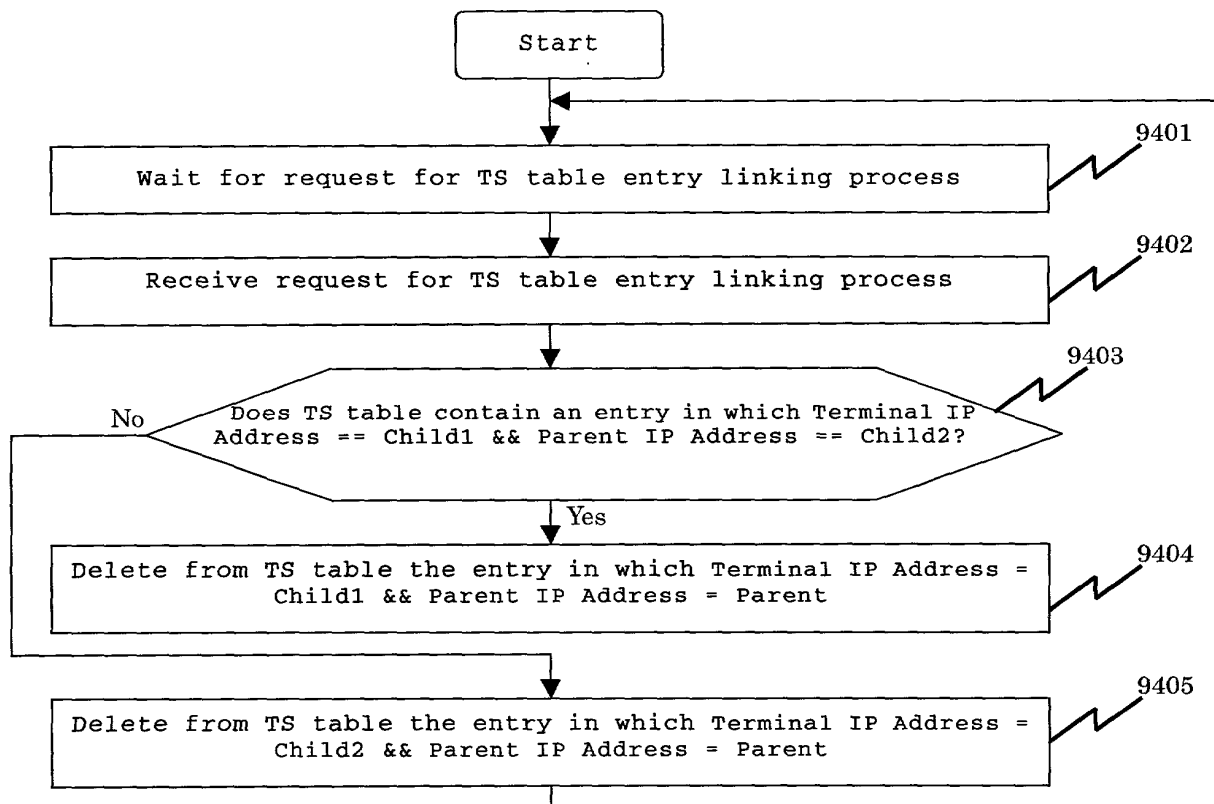
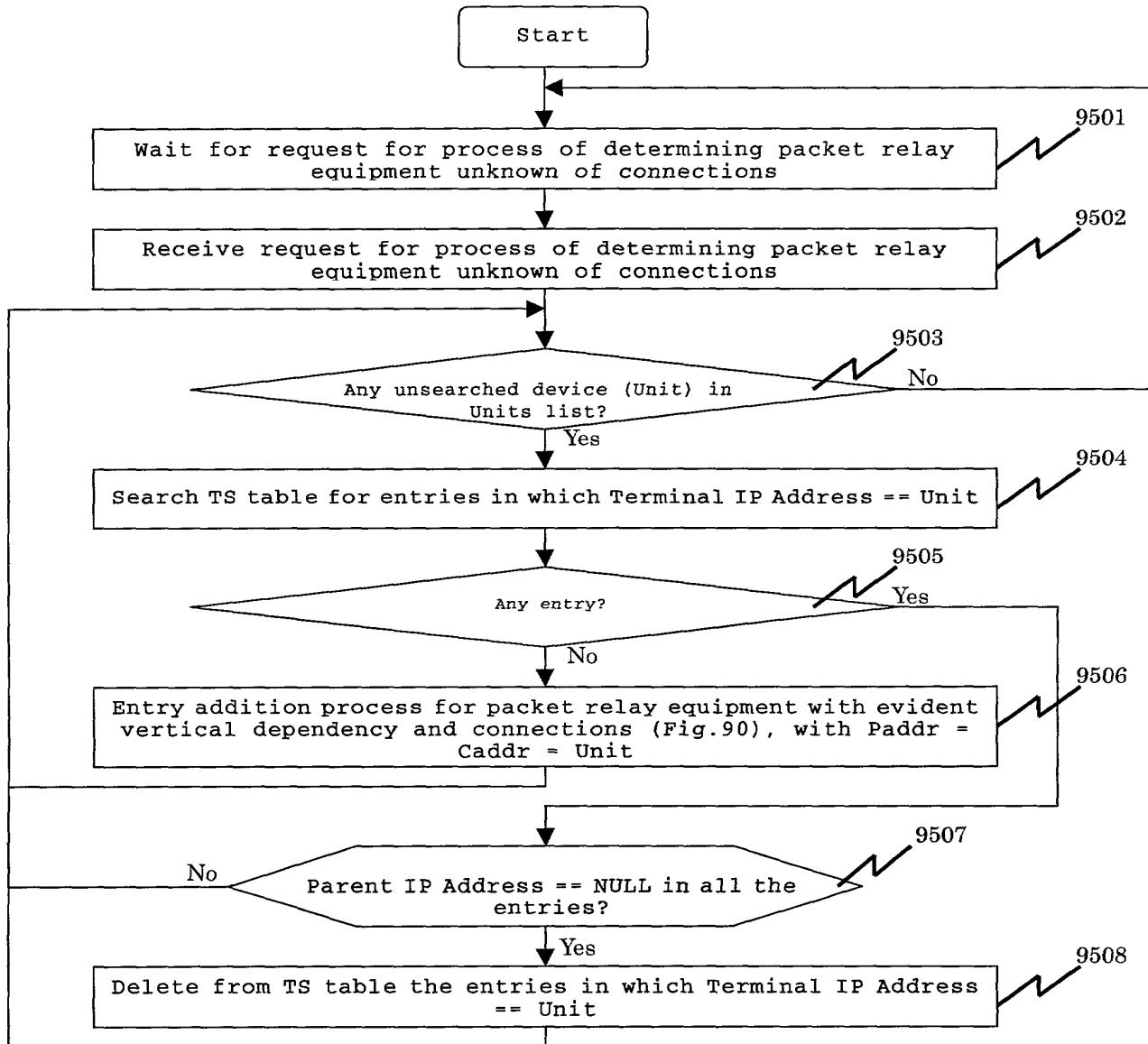


Fig. 95

Operation Flowchart 40 for Auto Discovery Module TS Table Creation  
TS Table Creation (Process of Determining Packet Relay Equipment Unknown of Connections)



# Fig. 96

Operation Flowchart 41 for Auto Discovery Module TS Table Creation  
TS Table Creation (Process of Determining Vertical Dependency between Root and Packet Relay Equipment)

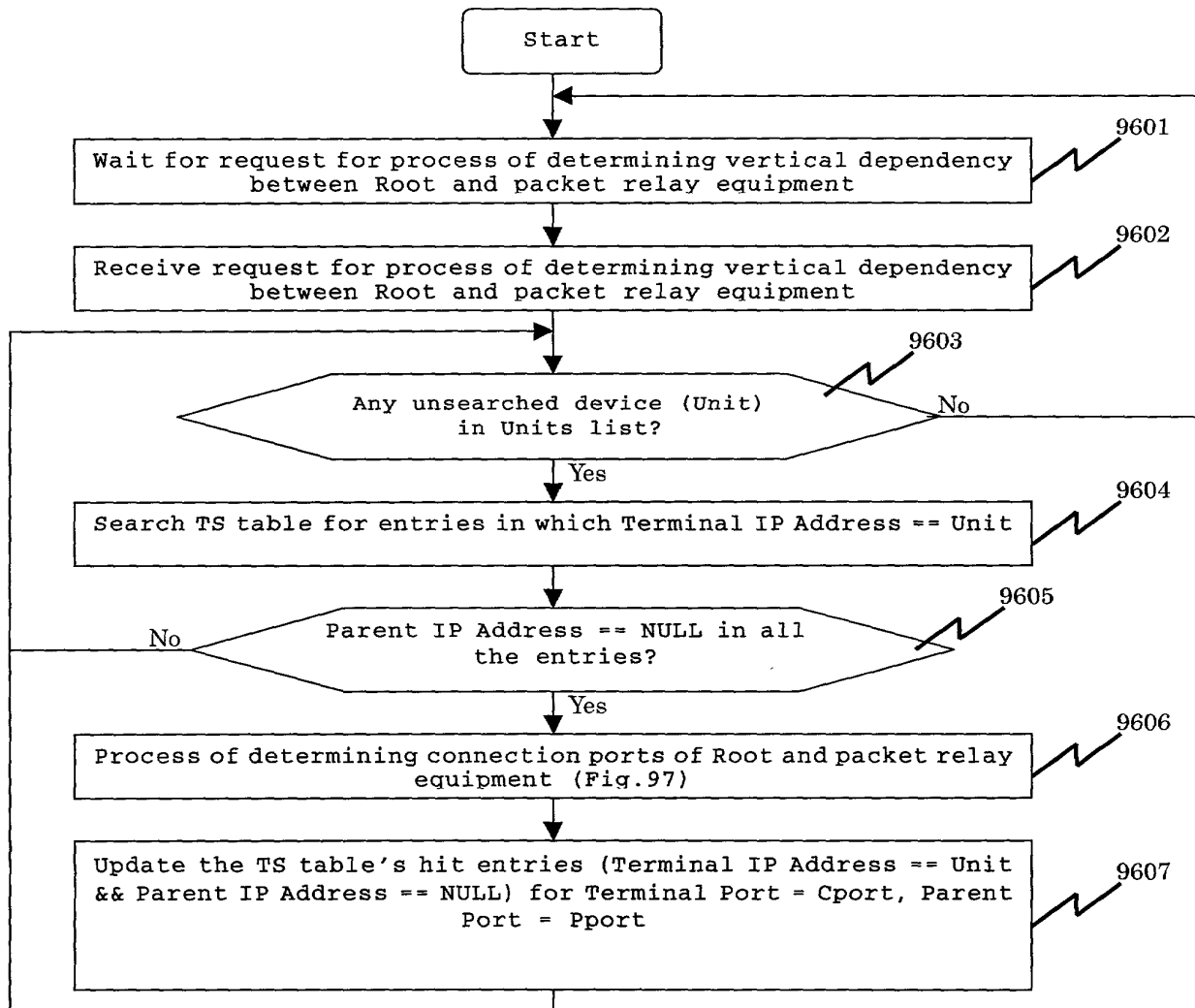
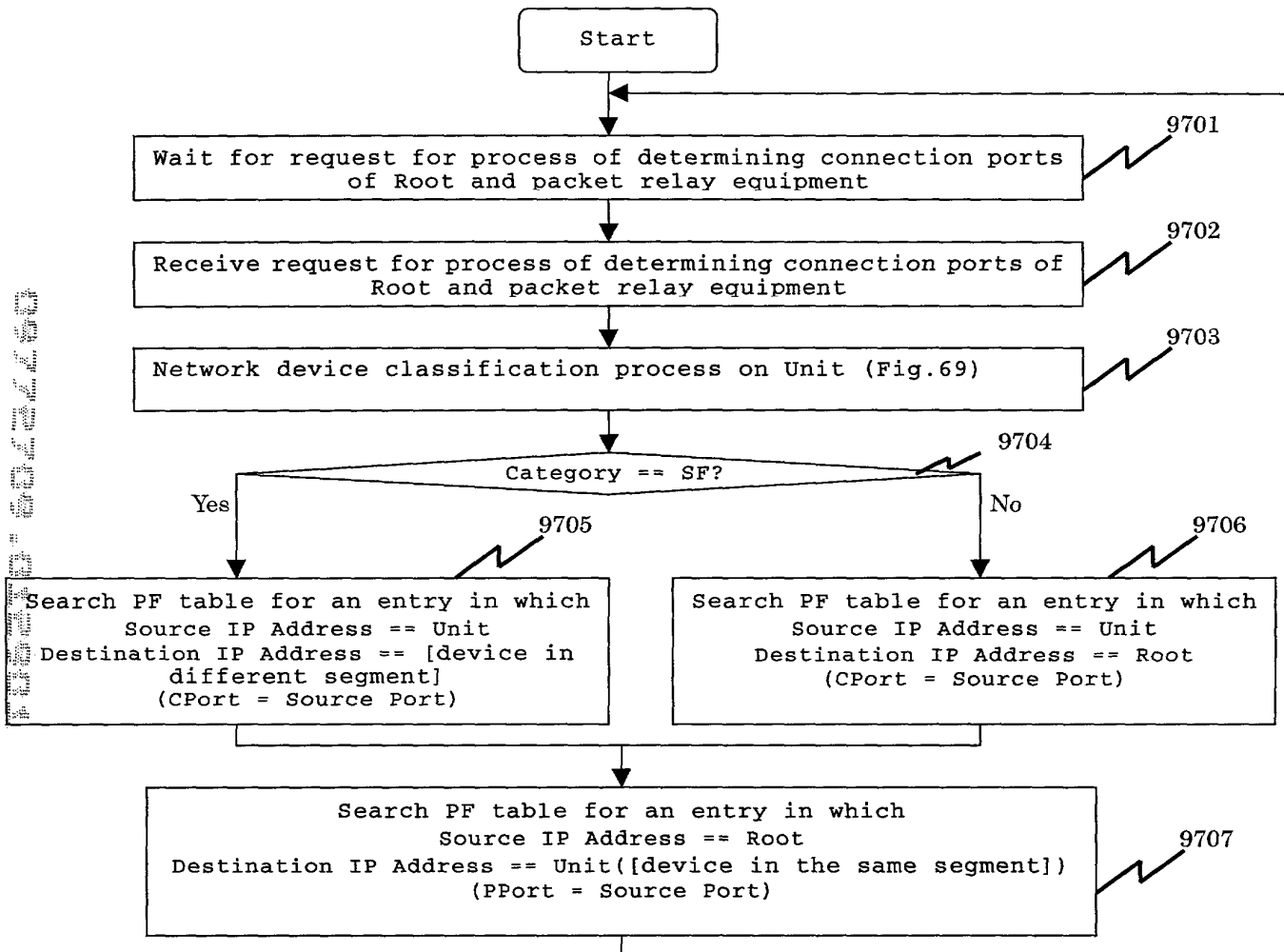


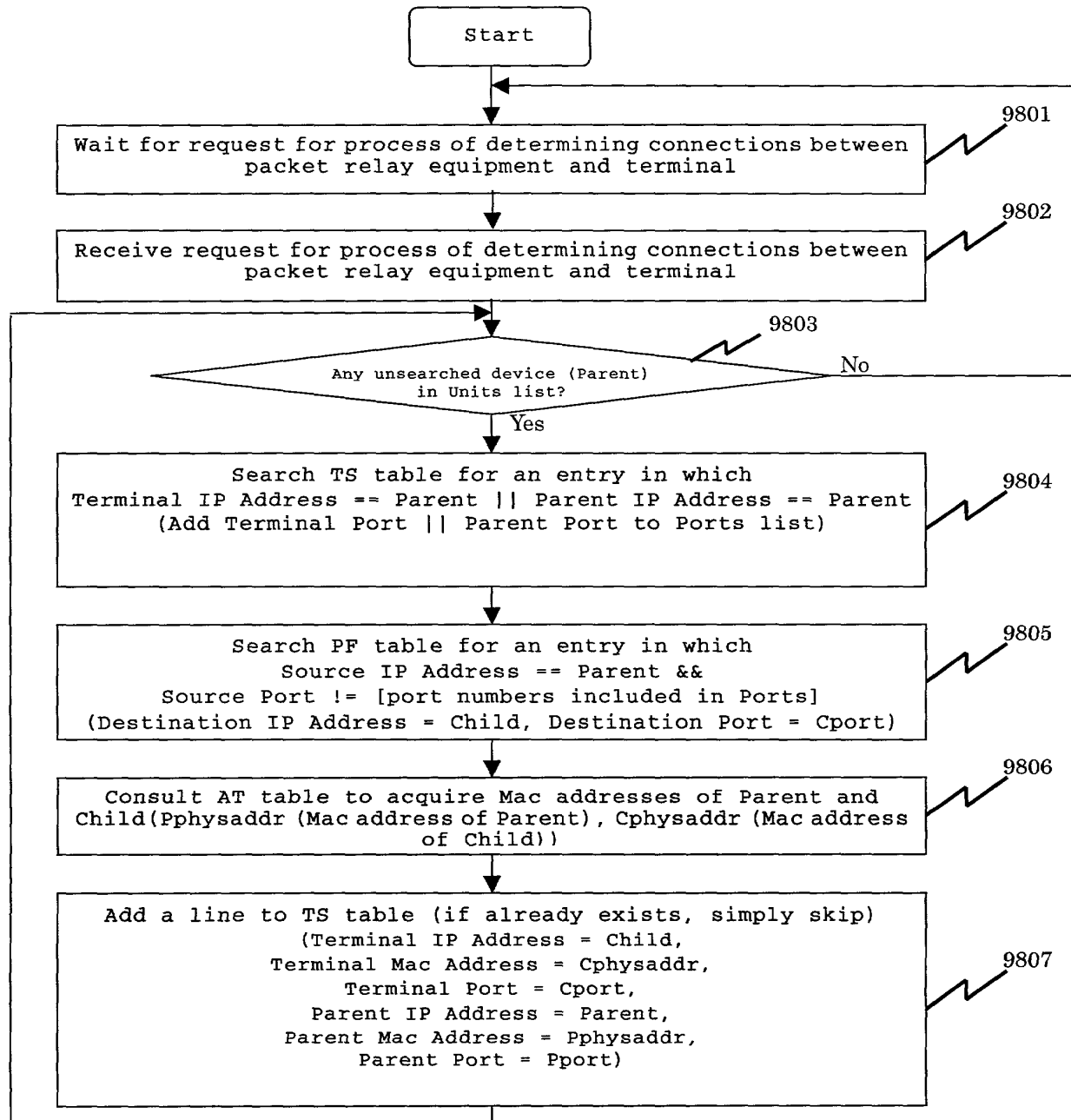
Fig. 97

Operation Flowchart 42 for Auto Discovery Module TS Table Creation  
TS Table Creation (Process of Determining Connection Ports of Root and Packet  
Relay Equipment)



# Fig. 98

Operation Flowchart 43 for Auto Discovery Module TS Table Creation  
TS Table Creation (Process of Determining Connections between Packet Relay Equipment and Terminal)



# Fig. 99

Operation Flowchart 44 for Auto Discovery Module TS Table Creation  
TS Table Creation (Interfaces MIB Evaluation Process)

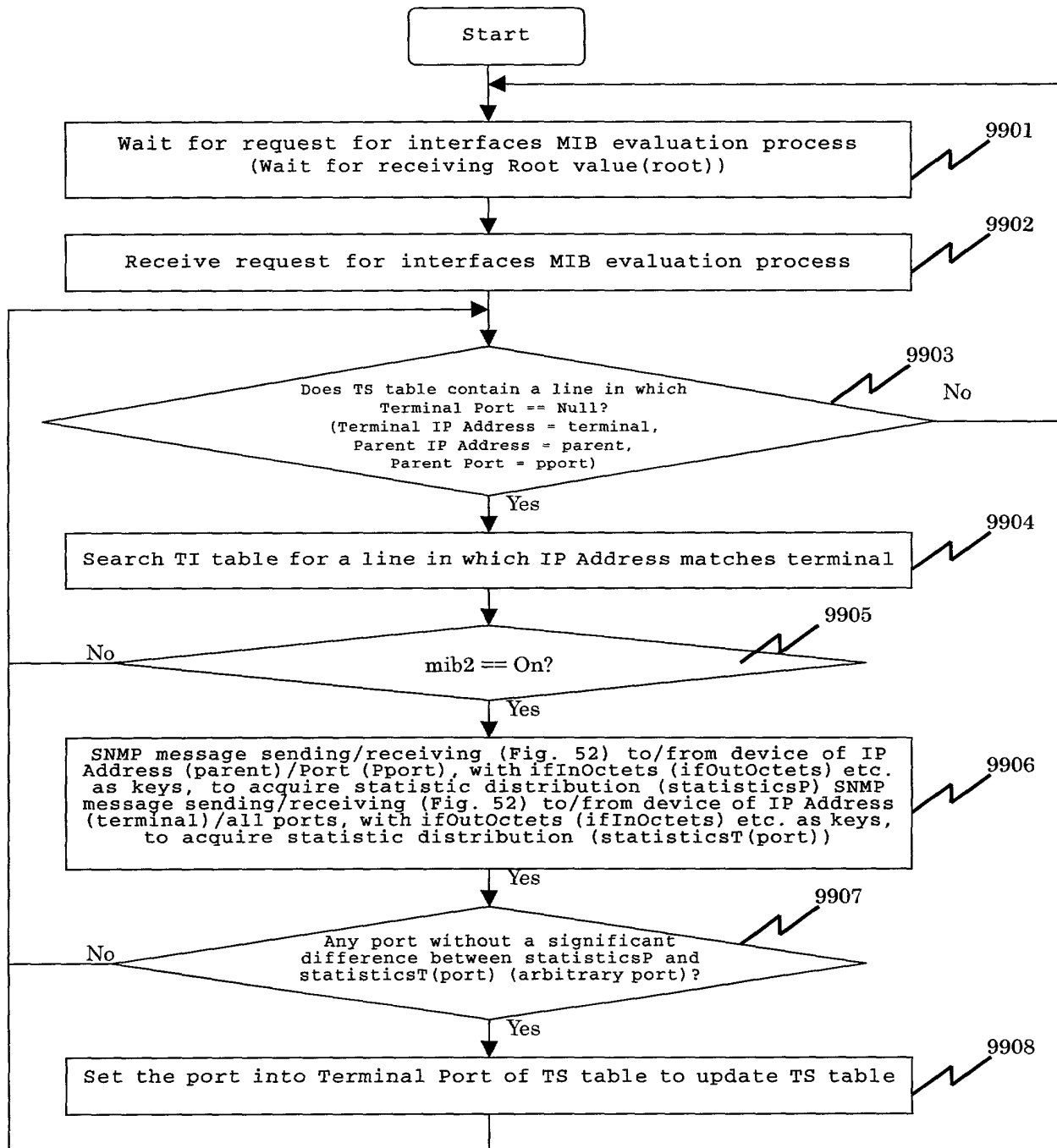




Fig. 100

Operation Flowchart 1 for Chart Display Program  
Network Configuration Chart Display Process

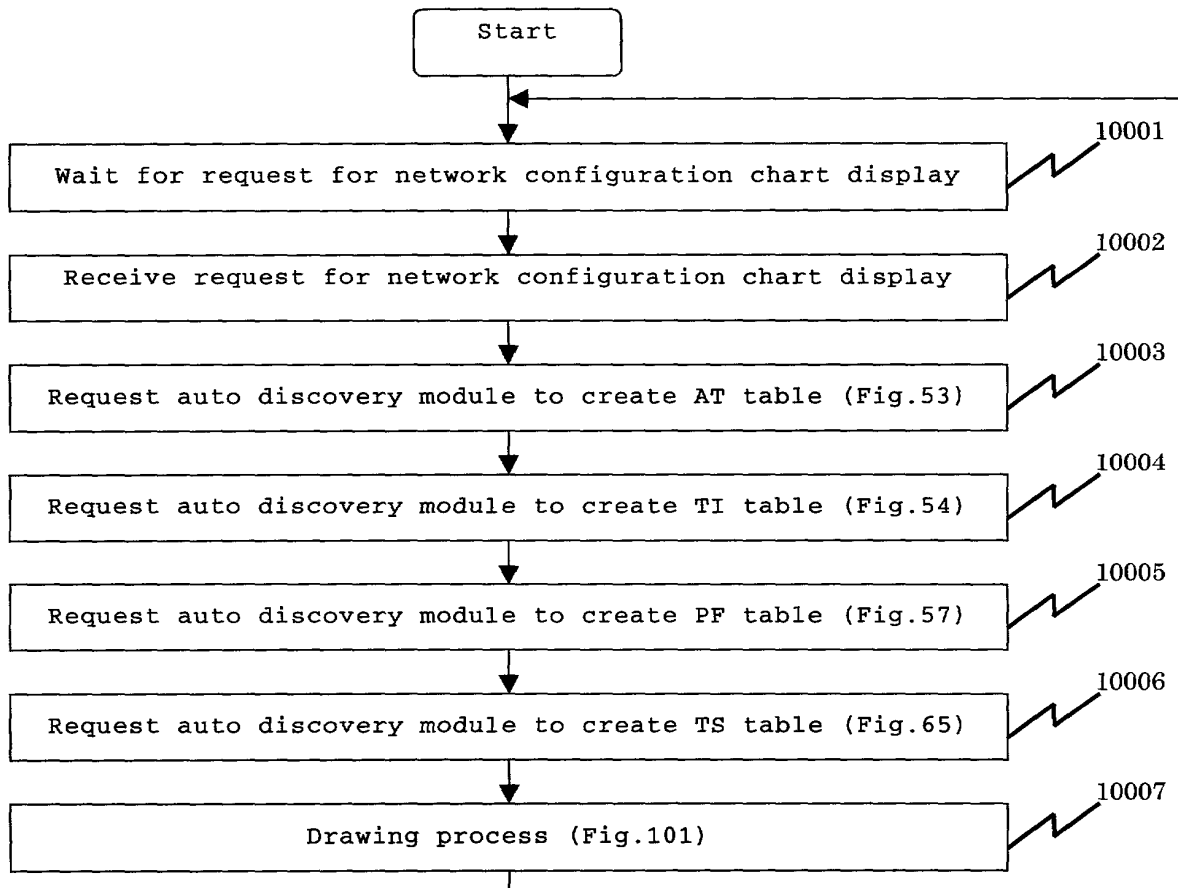


Fig. 101

Operation Flowchart 2 for Chart Display Program  
Network Configuration Chart Display (Drawing Process)

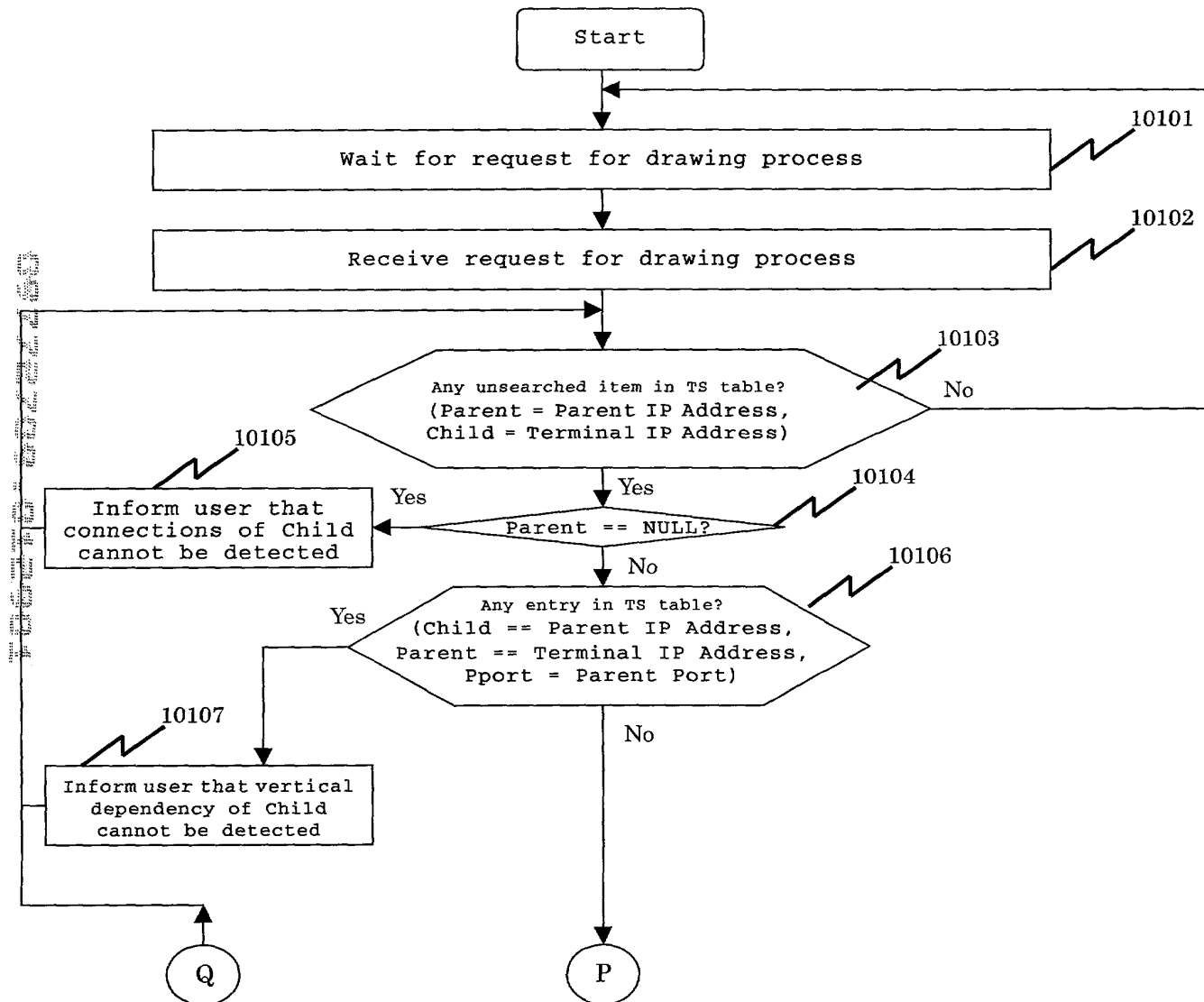


Fig. 102

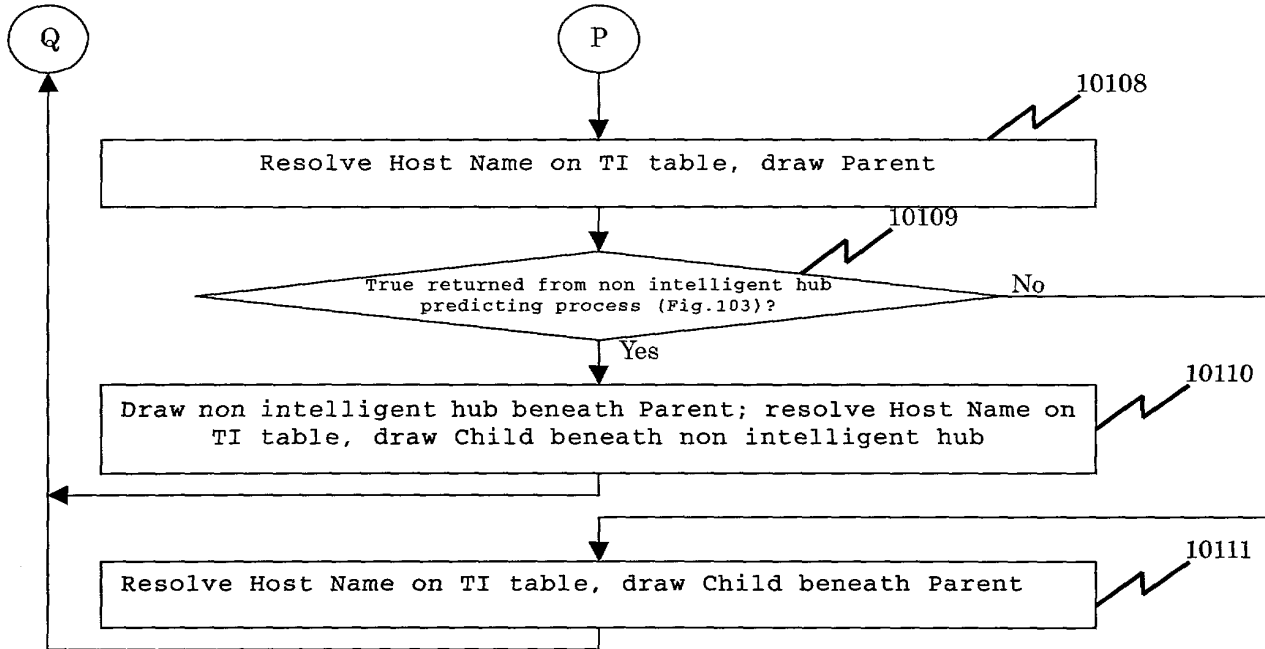
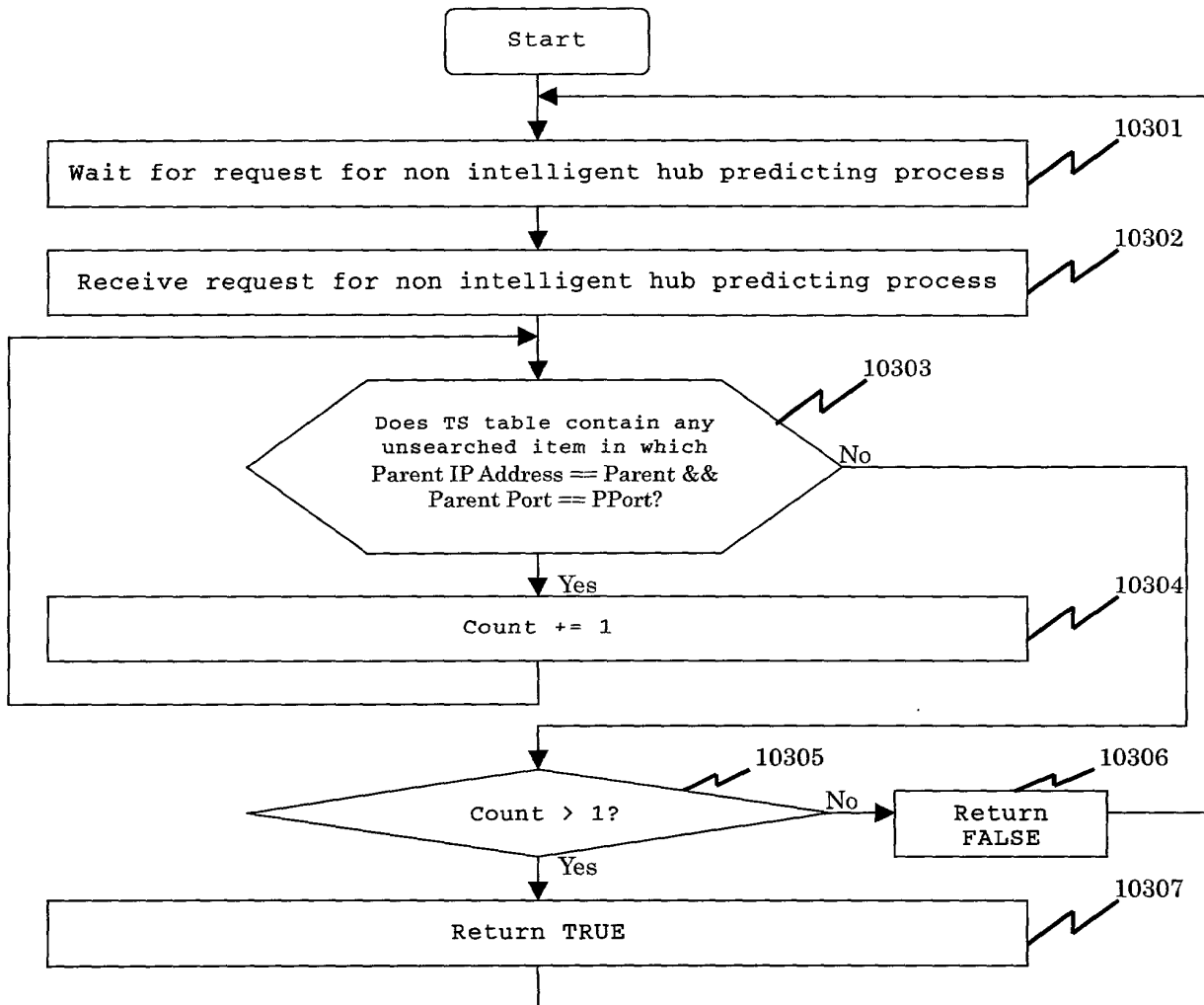


Fig. 103

Operation Flowchart 3 for Chart Display Program  
Drawing (Non Intelligent Hub Predicting Process)



# Fig. 104

## Operation Flowchart 4 for Chart Display Program Information Drawing Process

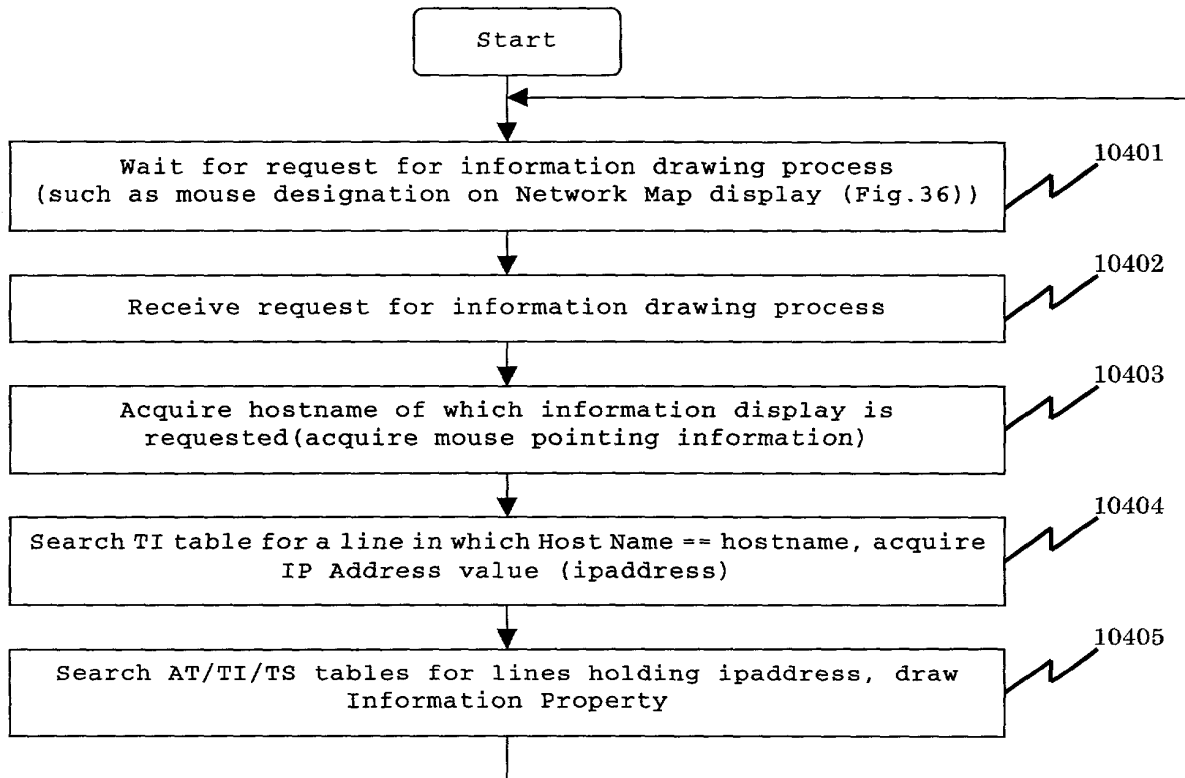


Fig. 105

Operation Flowchart 5 for Chart Display Program  
Process of Monitoring Modification of Connection Destination

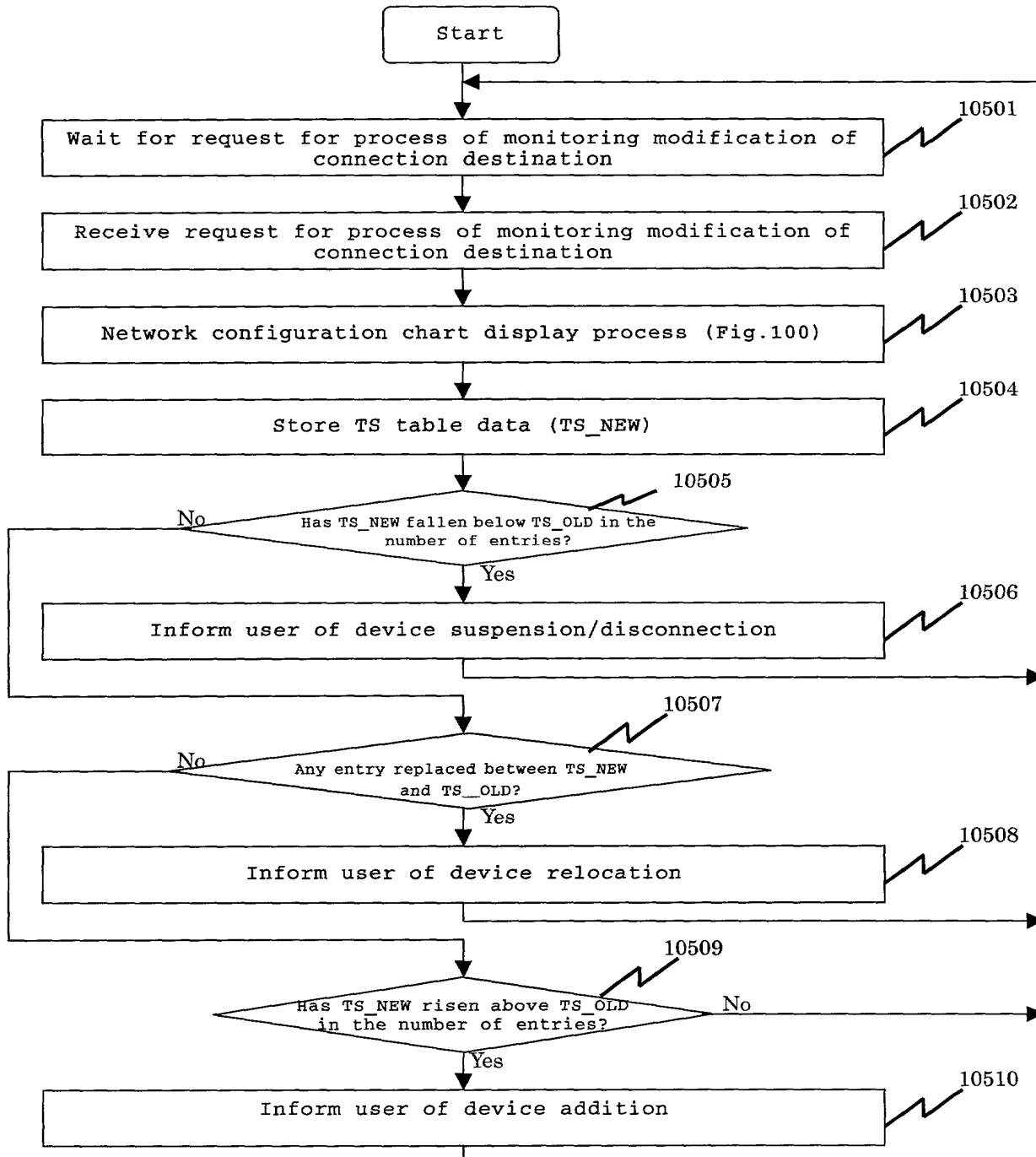


Fig. 106

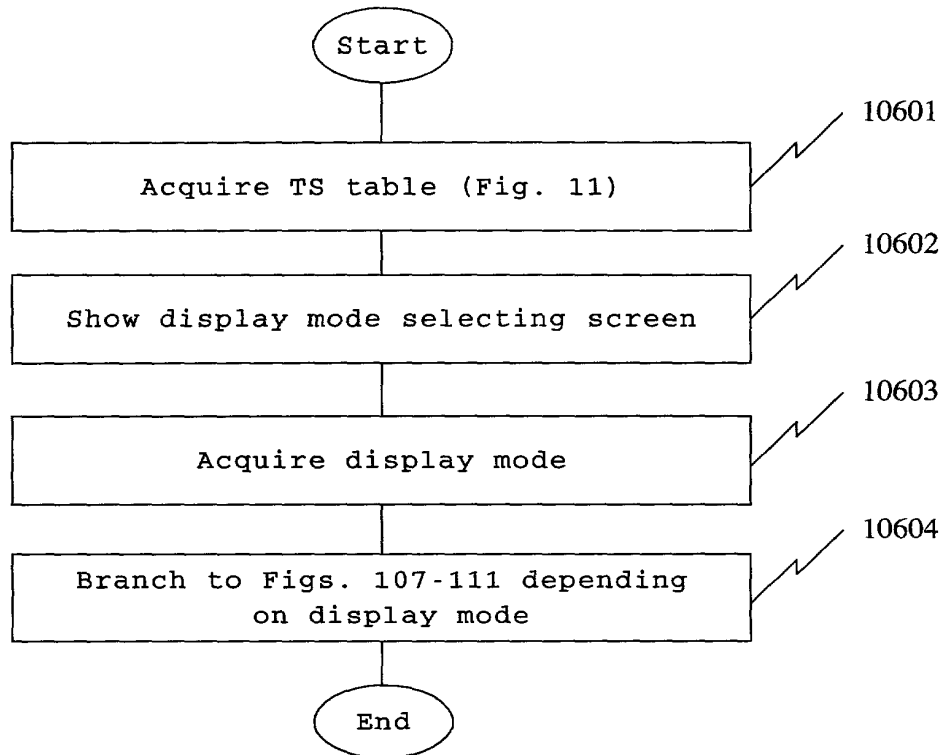


Fig. 107

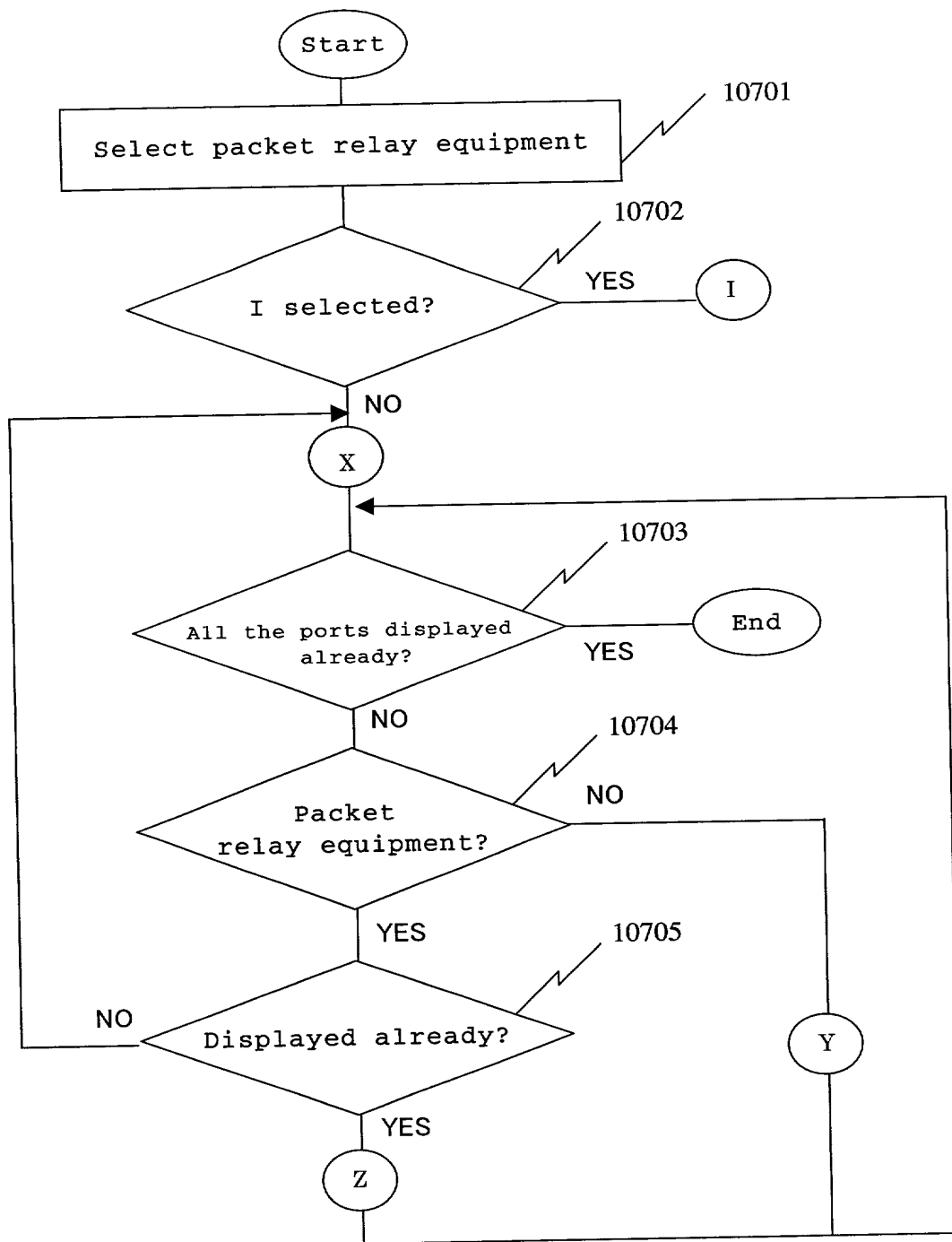




Fig. 108

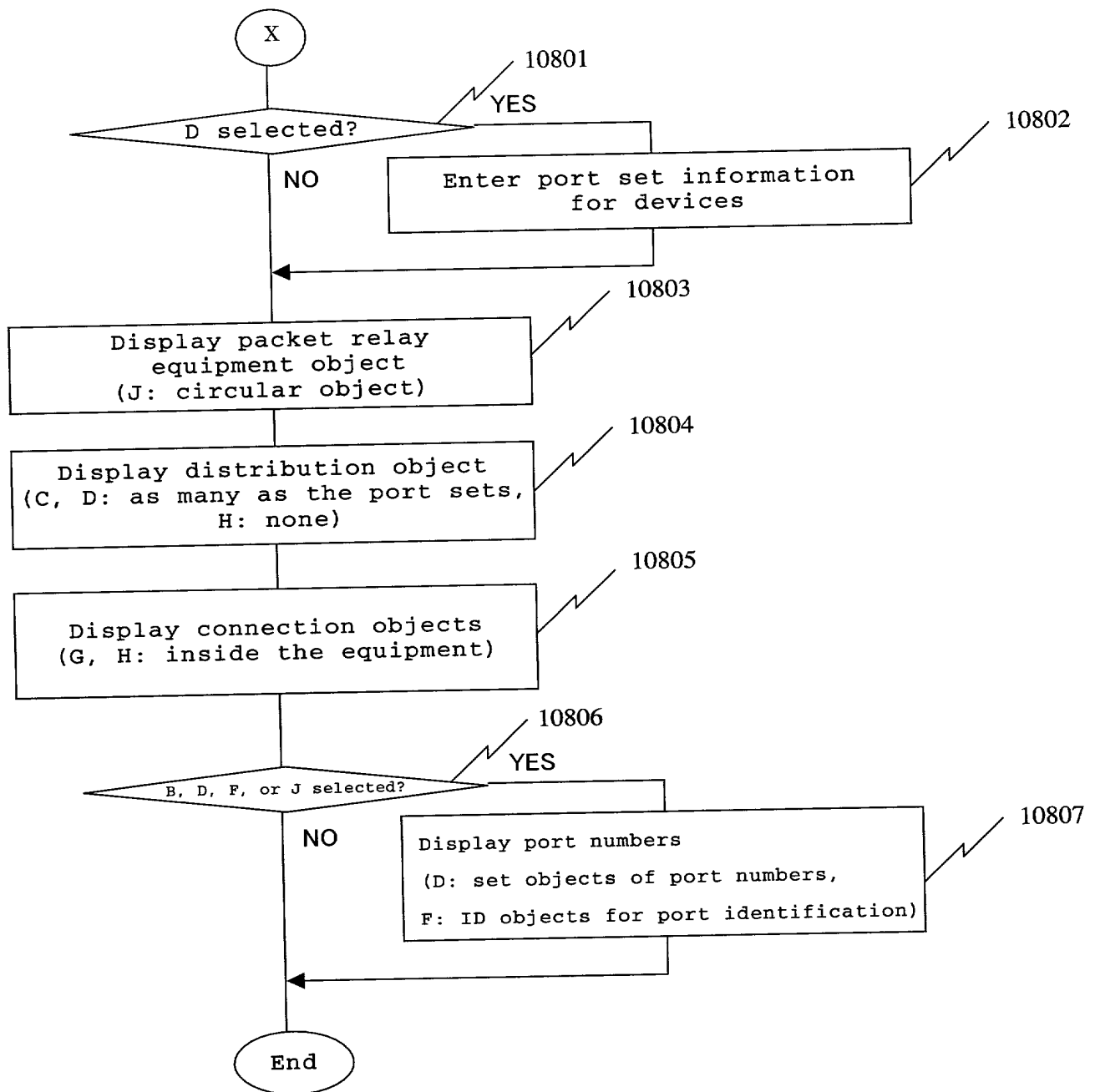


Fig. 109

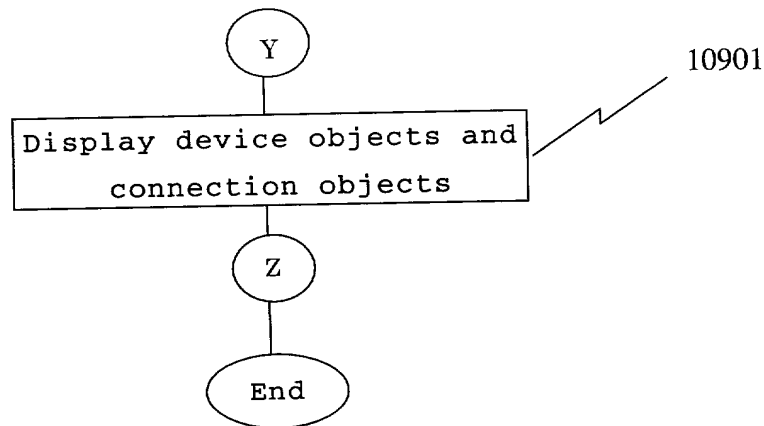


Fig. 110

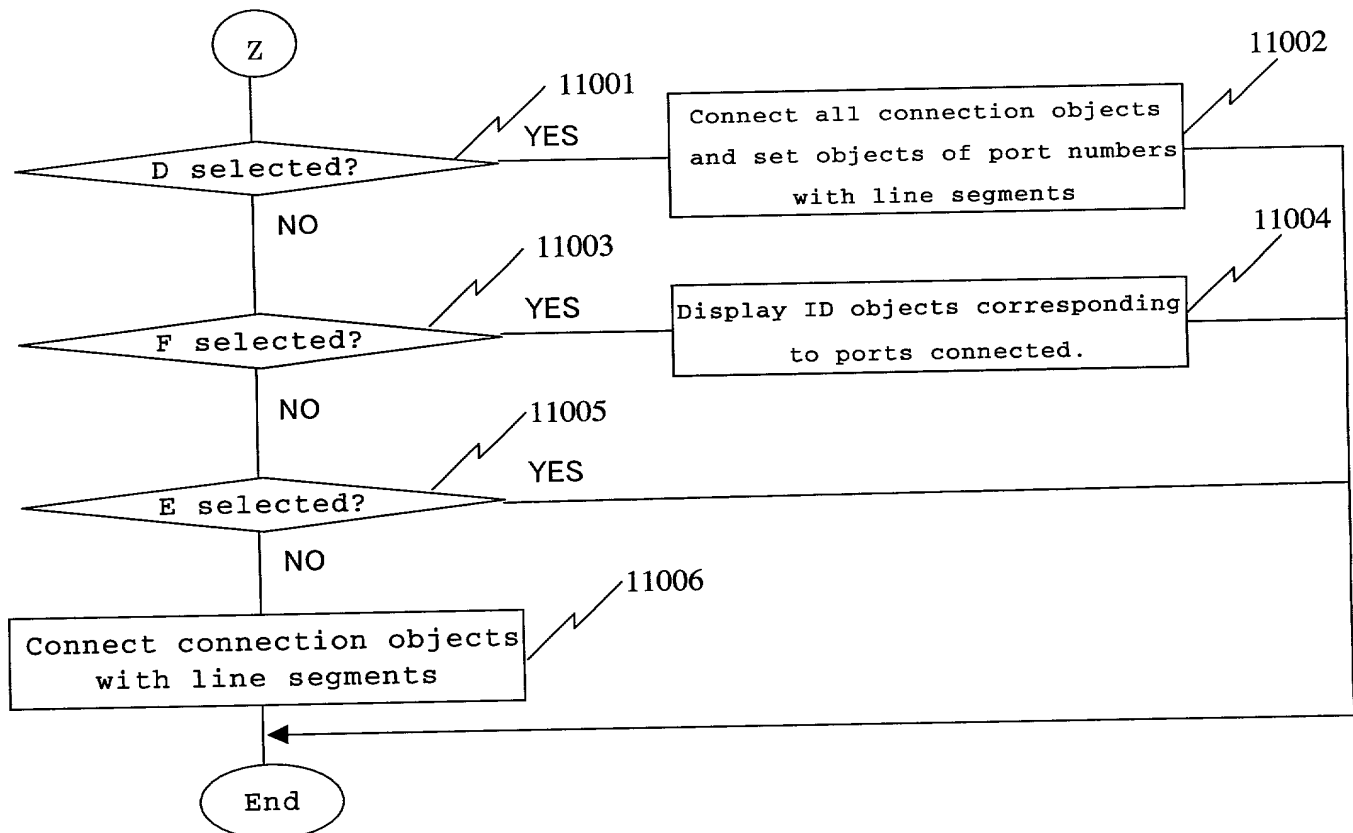


Fig. 111

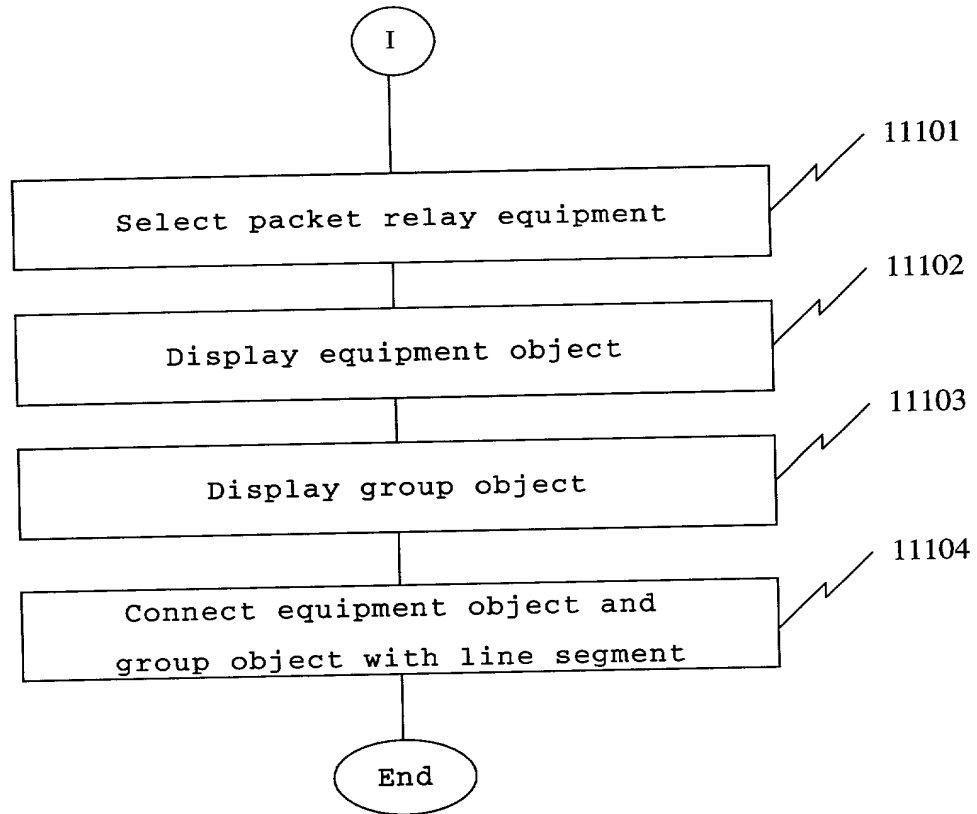


Fig. 112

